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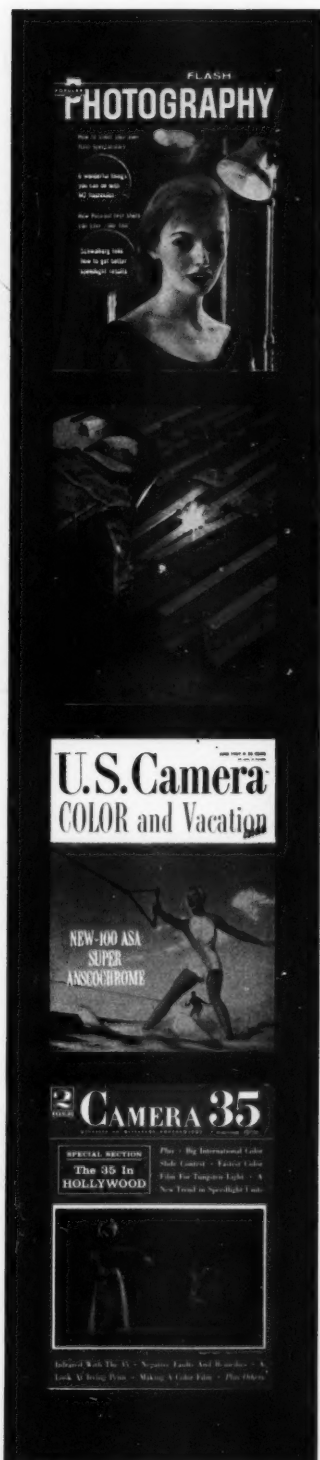
The big switch is to Super Anscochrome

Bob Schwalberg, technical editor, *Popular Photography*—“First honest-to-goodness available light color film ever produced... tungsten Super Anscochrome is the first real solution to offer either or both fidelity and speed. Color values are unbelievably good... the whites are white... the blacks are black.”

Norman Rothschild, color technician, *Leica Photography*—“I find Super Anscochrome an exciting product. It has speed without the loss in quality that has been associated with high-speed color. It will open many new doors in color photography.”

Ed Hannigan, Editor, *U.S. Camera*—“... remarkable ability of the film to make pictures under difficult lighting... graininess and quality-wise, in color rendition it is excellent... we like it... you will also like it.”

Philip Leonian, Color Columnist, *Camera 35*—“The most versatile and talented color film ever to see the light... recording shadow detail barely visible to the eye... behaves like a champion... Super Anscochrome, Daylight and Tungsten—I love you!”



America's top editorial experts and photographers all pay tribute to Super Anscochrome.® Here, in their own words, is what they have to say!

Hugh Bell, cover maker for *Popular Photography* says, “Color photography takes on a new creative excitement since high speed Super Anscochrome appeared on the market.”

John Wolbarst, consulting editor, *Modern Photography*, “We tested Super Anscochrome, were amazed at its speed, thrilled by what it offered.”

Dennis Hallinan, U.S. Camera cover maker, comments, “Outdoors, Super Anscochrome permits high shutter speeds, small apertures for stop-action and foreground-to-horizon sharpness.”

Jerry Dantzic, cover photographer for *Camera 35*, remarks, “New Super Anscochrome tungsten is a must for all color photojournalism.”

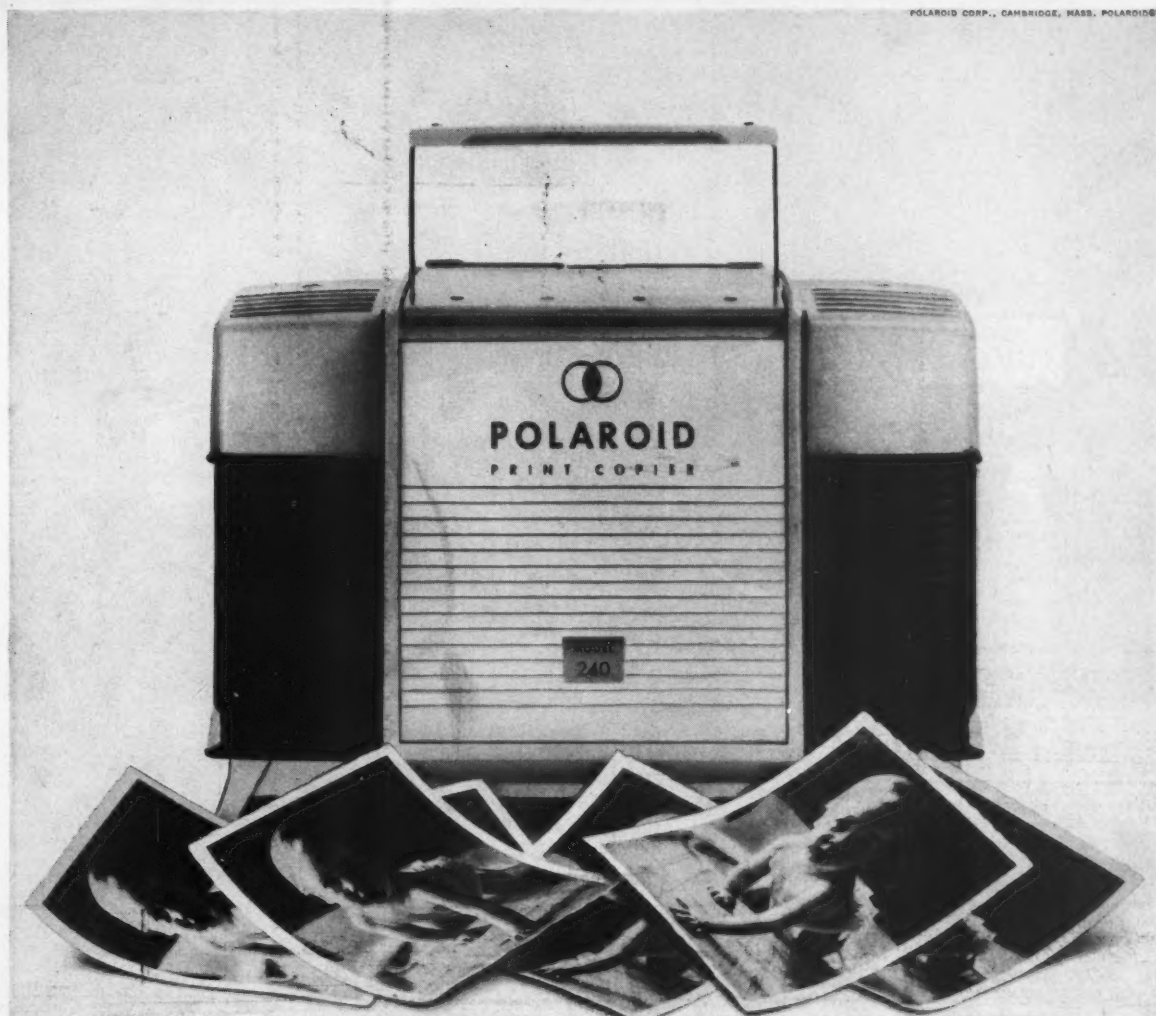


Record Album Covers—Says Barry Kramer, “I use Super Anscochrome exclusively. Its better speed, color rendition and resolution give me quality that produces a “stopper” album cover every time.” Ansco, Binghamton, N.Y., A Division of General Aniline and Film Corp.

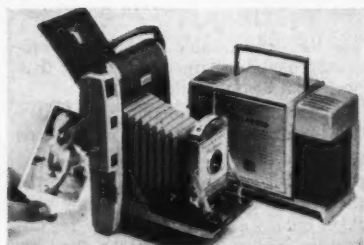


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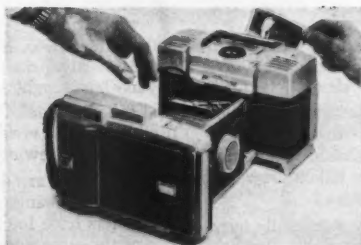
FOR EVERYONE WHO TAKES PRIDE IN HIS PICTURES



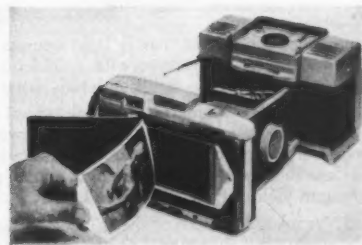
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1. The camera that gives you a picture in 60 seconds now gives you *extra copies in 60 seconds!* With this new Polaroid Print Copier, you can make excellent *duplicates* yourself, right in your living room, instead of having them done on the outside.

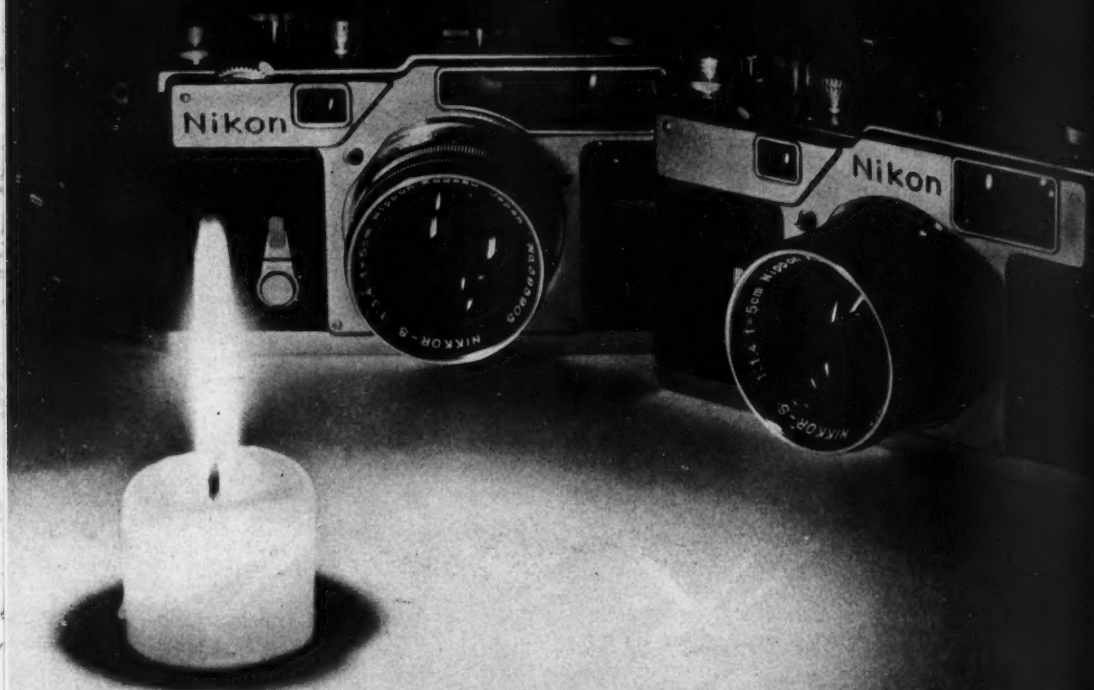


2. Simply slide your original snapshot into place inside the Print Copier, slip your Polaroid Land camera into position, and you're ready to take "a picture of your picture." (The Print Copier has everything else built in: copying lens, lights, timer.)



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BY CANDLELIGHT: NIKON SP WITH UNIVERSAL VIEWFINDER SYSTEM AND NIKON S-3 WITH TRIFOCAI VIEWFINDER FROM \$309.50 TO \$415 AND HIGHER

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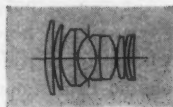
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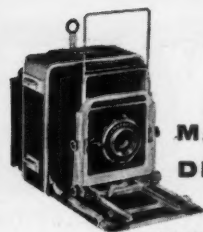
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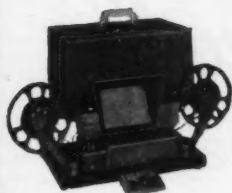
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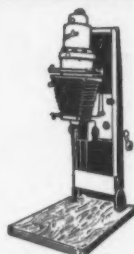
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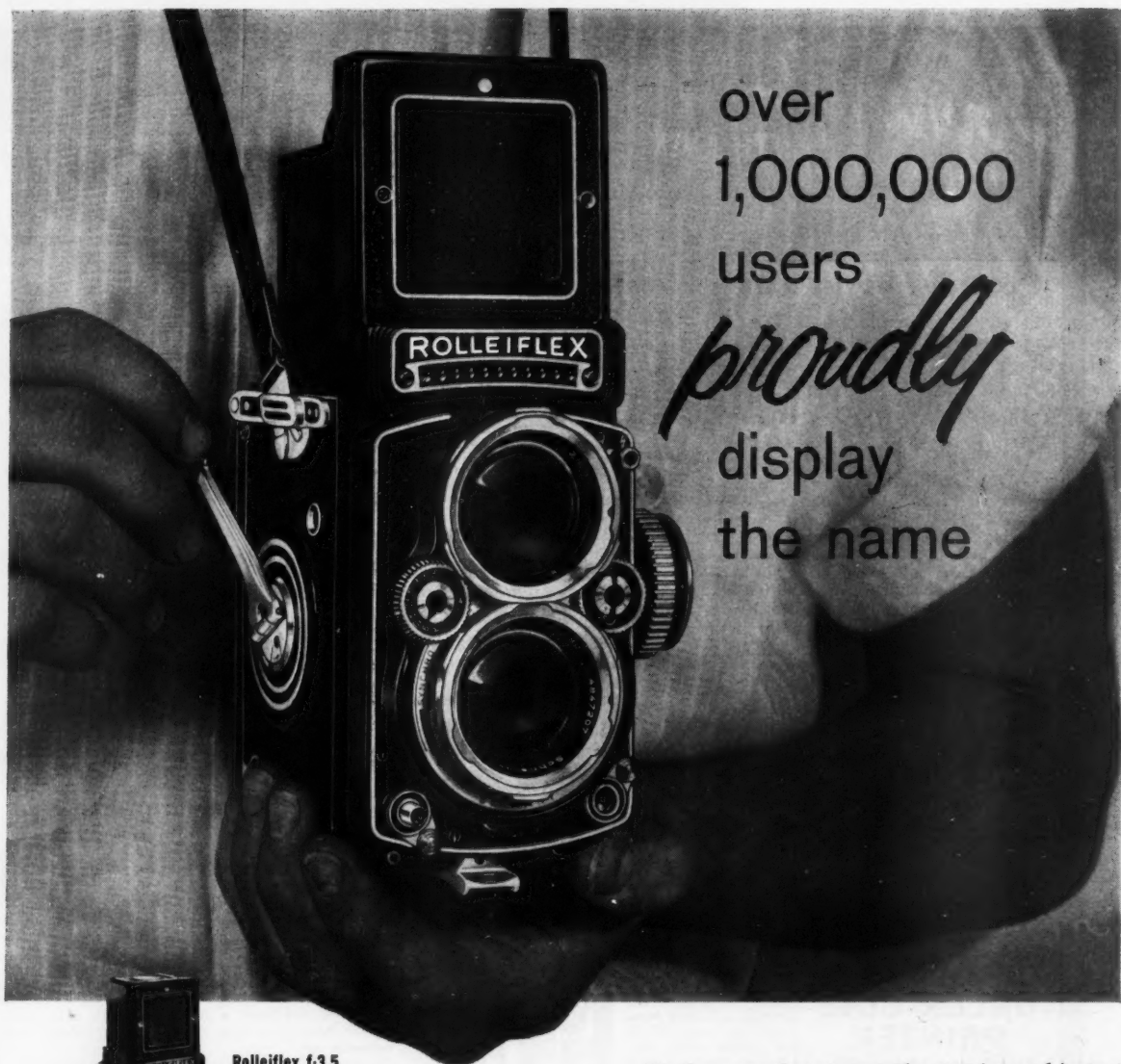
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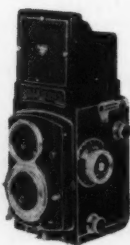
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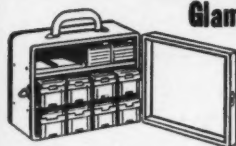
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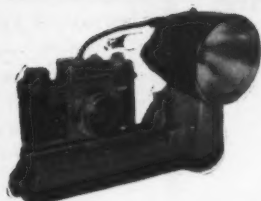
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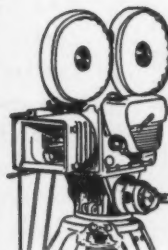
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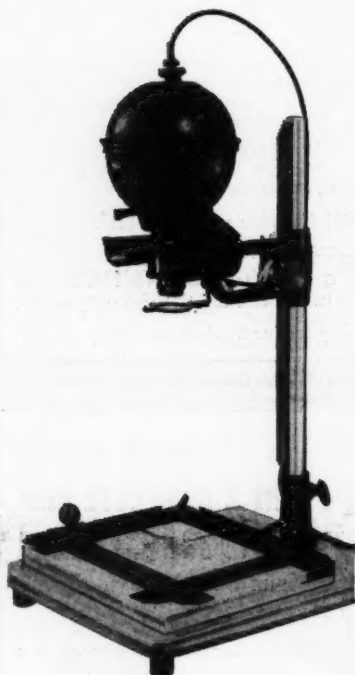
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Coffee Break WITH THE EDITORS

THIS MONTH'S COVER • • •

It wasn't easy—but they got what they wanted. MODERN's Art Director, Ernest Scarfone, had the idea and photographer Hal Reiff recorded the tricky multiple exposures (ranging from 1/10 to 1/25 sec.) on 8 x 10 Anscochrome Tungsten. Geanie McDonald just walked and walked—and walked!

EX-COVER GIRL • • •

MODERN's cover girls have a way of deserting us for the rarified atmosphere of Hollywood sound stages. First



Model . . .

it was Suzy Parker, the leggy redhead who dressed up the cover of our first glamour issue in April, 1955. Now it's Millie Perkins, who front-paged our February and April, 1958 issues, and whose dark-fringed hazel eyes



Actress . . .

prompted considerable comment from our readers.

Millie, a 19-year-old top New York model with no previous experience or interest in the theater, was chosen to play the title role in 20th Century Fox' forthcoming "The Diary of Anne Frank." Reversing the usual juvenile-to-young-sophisticate routine, she has temporarily given up the sleek, up-sweep look for the ingenuous make-up and hairdo of a sensitive young teenager. If Millie is as expressive in wide-screen CinemaScope as she is on 8x10 Ektachrome, she should be a raging success.

PROGRESS • • •

Up in Boston, photography has finally been accepted as "art," along with painting, sculpture, architecture, dance, drama, opera, poetry and music. For the first time the annual Boston Arts Festival (held in June) included a photographic exhibition—featuring over 15 of the West Coast's leading photographers.

CLIFF HANGER • • •

The most fascinating continued story of recent times ran in *Click*, the official publication of the Photographic Society of India. Called "Colours and How We See Them," it was written by Professor Hamilton Hartridge, F.R.S., Emeritus Professor of Psychology at the University of London, and began in the September 1957 issue. (Communications with India are not all they might be, apparently.) Toward the bottom of page 10 we read:

"Yellow is reflected by both red and green pigments but not strongly by either pigment. After red and green pigments have been mixed together (Continued in the next issue)"

We waited breathlessly for the October issue (which arrived in April) and sure enough. . .

"(Continued from the previous issue)

ther, a beam of light passing through the mixture, towards the canvas or cardboard support, reflects off red particles on to green ones, and vice versa, a large number of times."

We blame it all on the atom bomb.

BEST FACE FORWARD • • •

Traveling? Maybe you'll want to fancy up your passport with a color photo! The Passport Office has announced it's okay—provided, of course, that it's up to snuff on size, pose and finish. This was no hasty decision ar-

(Continued on page 14)

"Here, try it"

say Contaflex owners



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When a Contaflex owner hands his camera to a friend and says "Try it", he is sure it is going to make a striking impression. For both amateur and professional owners know that Contaflex's unique sighting and focusing system is the greatest aid in taking crisp, sharp pictures. The view is so BIG and brilliant—and focusing with the split-image rangefinder in ground-glass ring is so fast and accurate.

And how versatile Contaflex cameras are! By the use of a bayonet-mounted tele component lens, distant subjects can be enlarged nearly twice the size. And to cover a wide field, just insert the wide-angle component. Models I and II can be equipped with a 1.7x tele attachment lens.

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Contaflex IV—Same as Contaflex III but has built-in exposure meter.

**The spectacular
35mm single-lens reflex**

COFFEE BREAK

(Continued from page 12)

rived at on a tired afternoon. No indeed! Nor was aesthetics the entire consideration. New color processes which eliminate fading and deterioration of pictures have made the color photo acceptable—even welcome, since color provides more accurate identification and makes those plaguing illegal substitutions more difficult.

While this news cheers us considerably, we have the nagging suspicion that color is not going to cure the most obvious ill—the “convict stare” common to most passport photos. (Our own is a particularly serious case.) We tend to blame the photographer's harsh, flat, careless lighting. But perhaps part of the fault lies with us, too. We think we must put on a solemn face—which more often than not looks grim in the finished print. However, the Passport Office is quite specific on this point. We quote the official bulletin: “There is no objection to the submission of passport pictures which depict the applicant as a relaxed, smiling person.”

So! Next time you sit for a passport photo, find a photographer who will help you put your *best* face forward—in glorious Kodacolor.

COMPETITION . . .

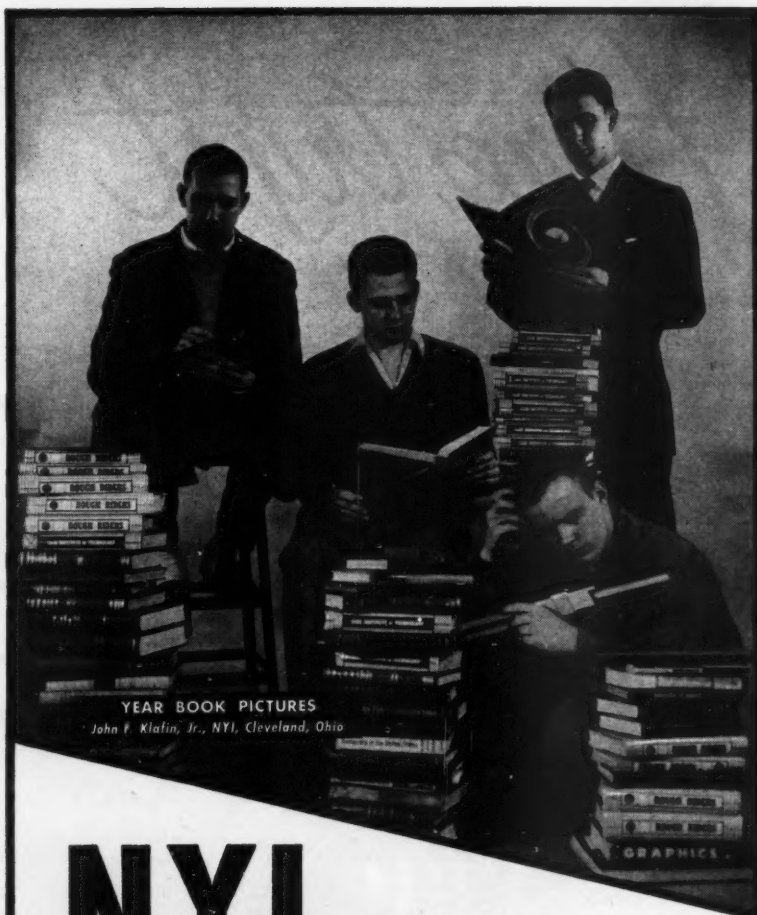
Minox users (particularly those with a finely developed competitive spirit) will be delighted to know that a second big national photo contest is being sponsored by the Minox Processing Laboratories of Forest Hills, N. Y. Minox photos may again be entered in either or both of two categories, “Business” and “Pleasure.” All entries will be judged by Joseph D. Cooper, MODERN's “Ultraminiature” columnist, David B. Eisendrath, Jr., technical editor of *Industrial Photography* magazine, and Bob Schwalberg, technical editor of *Popular Photography*.

Ten prizes will be awarded in each division, first prize being a Minox B Automatic camera with built-in coupled exposure meter, plus an inscribed Minox Trophy.

Minox photographs snapped between May 1, 1958 and January 31, 1959 are eligible. For details, see your photo dealer, or write Minox Processing Laboratories, Forest Hills, N. Y.

USED CAMERA PRICE GUIDE

MODERN PHOTOGRAPHY's *Guide to Used Camera Prices* lists more than 900 still, stereo and movie cameras—from Adox to Zeiss—and their used selling prices from coast to coast. A valuable Baedeker for the bargain hunter, its price is only 25 cents, to cover postage and handling. Order your copy from Dept. G, MODERN PHOTOGRAPHY, 33 W. 60 St., New York 23, N. Y.



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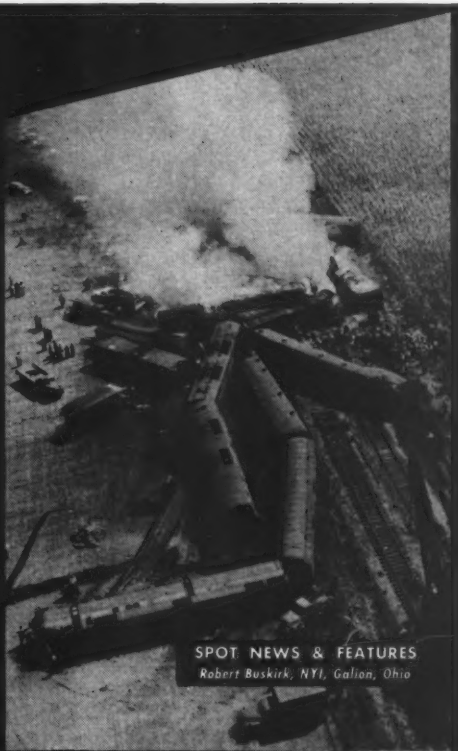
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SPOT NEWS & FEATURES
Robert Buskirk, NYI, Galien, Ohio

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LETTERS TO THE EDITOR

Four Months A Photographer

Sirs:

I have been a constant reader of your delightful magazine, which offers me so many facts. I only took up photography as a hobby four months ago, and must admit that all my knowledge of picture taking has been acquired from your magazine. I exposed this candid shot to capture the mood of a



girl who just missed out on a Sunday family outing. I used a Rolleiflex set at f/4 and 1/30 sec.

Being a student of architecture in the University here, I am sure photography will help me tremendously.

James T. F. Fong

Victoria, Melbourne,
Australia

Of Cats and Garbage

Sirs:

For the past 12 years I have been a world traveler and adventurer, visiting such places as Tibet, India, China, Burma, Africa, Mexico, South America and Alaska. To mention a few. I have had the experience of visiting with some very prominent photographers in this old world of ours and have come to some interesting conclusions.

To me, the individual with a camera is an artist and should be free to give expression to his pictures and capture the mood that first inspired him to take the picture. It seems to me that many of the pros must be either conformists or robots who only release the shutter after mechanically following a certain pattern of rules that has been foisted upon them.

Even the foreign publications are constantly filled with this nonsense,

though I do find, from time to time, a few editors with the forward look. Which, incidentally, is the very thing I like most about MODERN PHOTOGRAPHY. You are not tied to antiquated tradition and I find some very stimulating material there.

In my case, when I take pictures for the sheer delight of it, I throw all the rules out the window and take the picture to capture that indefinable something we call mood. Even if it is only the rear end of an alley cat sticking out of a garbage can, if it conveys the feeling of the photographer, it is a good picture. And regardless of composition, exposure and technical accuracy, if it fails in this one aspect, it is a failure.

Franklin, Idaho Roy H. Lauritzen

Sputniks And The Nickel Cigar

Sirs:

In this modern day world of Sputniks, high speed films and fancy developers it has become as difficult to find a good comprehensive photo magazine as the proverbial "nickel cigar." But, during the past two or three years, it has been my pleasure to see MODERN PHOTOGRAPHY emerge from the field as the outstanding photo magazine.

Your column and columnists are the best. Especially do we like "Coffee Break." The feature articles are of the best and the technical features are of special interest to the press photographer.

Many thanks for a wonderful magazine and for the untold help you have been to the photographer through the media of the printed page.

Curt Armstrong
Chief Photographer
The Sun-Telegram

San Bernardino, Calif.

Smog, Anyone?

Sirs:

After reading photography magazines for many years, I have noticed that fellow photo fans can be depended upon when asked for aid.

In connection with an air pollution survey, I am seeking photographs from all over the world of any convenient mailing size; revealing smoke, dust, or haze over a city.

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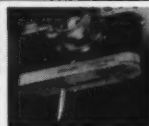
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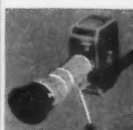
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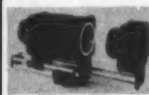
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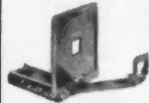
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New Photo Books

THE MOVIES, by Richard Griffith and Arthur Mayer. 442 pages, many illustrations. Simon and Schuster. \$15

The subhead under the title on this book's jacket reads: "The sixty-year story of Hollywood and its effect on America, from pre-nickelodeon days to the present, told in 1,000 . . . pictures . . . 150,000 words. . ." That about sums it up.

Messrs. Mayer and Griffith reached deep into the bins of stills to put together this pictorial "history." (They were collected largely from the Museum of Modern Art, where Griffith is Curator of Films, and the film companies, Mr. Mayer's domain.) The old antics and the old faces are there: Chaplin, Pickford, Keaton, Swanson, Gable, Garbo, Astaire. So are the new.

Starting with the birth of the movies, their progress—and to some extent, their influence—is traced successively: early nineteen-hundreds, the twenties, thirties, the war decade and the present. Comedies, serials, documentary, westerns, gangster films, spectacles, horror and sex films are reviewed in a staggering amount of pictures. But only thumbnail pieces of text have been granted to the reader who wants to see ideas in writing.

Your impression is one of great fun, when you first look through *The Movies*. There's something particularly compelling about the old faces and early escapades along the celluloid trails. Seeing them, you are even more respectful about the primitive (by modern standards) tools which early directors and cameramen had at their disposal to produce important works of art.

The book is showy, all right. Yet it lacks the brilliance and depth found in other impressive contributions (including those of Mr. Griffith) to the world of film criticism and analysis.

Or, pictures often tell much of a story—but seldom the complete one.

—D. J.

IKOFLEX GUIDE, by W. D. Emanuel. 96 pages, illustrated. Focal Press, London. Amphoto, New York. Paper cover, \$1.95

The twin-lens Ikoflex camera is the latest to undergo the scrutiny of W. D. Emanuel, author of a number of other
(Continued on page 24)

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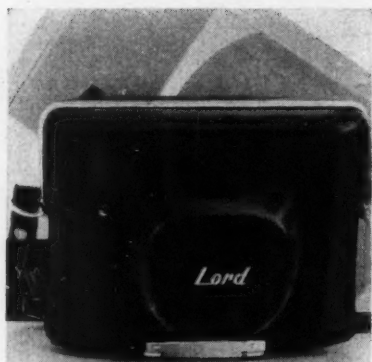
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ULTRA MINIATURE

by **JOSEPH D. COOPER**

Binocular photography with the ultraminiature: some pointers for better pictures.



The light weight of the ultraminiature camera makes it ideal for shooting through binoculars. In binocular photography, the camera is mounted with its lens centered on the exit pupil of the binocular eyepiece. The two optical systems then become as one. The resulting lens focal length is the product of the binocular "power" multiplied by the focal length of the camera lens. Thus a 1-in. lens coupled to a 7-power binocular gives a 7-in. telephoto.

There are only two ultraminiature cameras, to my knowledge, for which mounting brackets are made. One is the Minox and the other is an inexpensive but nice camera called the Tuxi, sold in Germany. (If you want to experiment, you can get both the Tuxi camera and binocular adapter for about \$18.50 delivered, plus duty. Write to me, c/o MODERN PHOTOGRAPHY, for details.)

You can, however, get a machinist to improvise a bracket, or you can even tape your camera to the eyepiece. The main thing is to *center the camera lens on the exit pupil of the left (fixed) eyepiece, as closely as possible*, with the eyecup removed. The camera lens should be wide open, set at infinity, unless it's fixed focus. (Under some conditions you'll mount the camera on the adjustable eyepiece of the binoculars, as explained below.)

Incidentally, while it's possible to use individual focusing binoculars, it's a tedious and troublesome chore and I've limited this column to the center-focusing type.

To take pictures, you first adjust the right (adjustable) eyepiece for your own vision, as though you were going to use the binoculars for normal viewing. Note the eyepiece adjustment for future settings. Thereafter, you can presume the picture will be in focus if the aerial image you see through the adjustable eyepiece is sharp.

However, up to about age 60 your

eyes can accommodate for poor focus. The best solution is the Bushnell system, in which the camera is mounted on the *right* (adjustable) eyepiece rather than on the left. You can couple your camera to the Bushnell 7 x 50 Bino-Foto binoculars, using a follow-focus eyepiece. This has a ground glass screen built in, which interchanges with the *left* (fixed) eyepiece. There's no mistaking sharp focus here. (Write D. P. Bushnell, Inc., 41 E. Green St., Pasadena, Calif., for full details.)

For use on your own binoculars, Bushnell sells a ground glass viewer which accomplishes the same thing. You may need an adapter ring, available from Bushnell, if the viewer fits loosely on the left eyepiece. With either viewer, mount your camera on the right (adjustable) eyepiece. If your pictures aren't sharp, then proceed as follows: Adjust the right eyepiece to + 2 diopters (indicated on the binoculars), then take a picture. Continue taking a series of pictures, moving the eyepiece ¼ diopter at a time, until you get to - 2 diopters. Then develop the film and choose the sharpest frame to correspond with the proper eyepiece adjustment mark.

This procedure is also necessary for fixed focus cameras, like the Minolta-16 and Ricoh Golden-16 (which should also be mounted on the right eyepiece), and with binoculars that are not optically balanced for photography.

Here are some additional pointers:

1. Effective lens aperture is determined by multiplying camera lens focal length by the power of the binocular, then dividing by the diameter of the binocular objective. Thus, with 7 x 35 binoculars on a 25mm camera lens, multiply 25 x 7 to get 175; divide 175 by 35 to get 5, which becomes f/5. With the Minox, this will work out to less than f/3.5, because of the 15mm focal length ($15 \times 7 \div 35 = 3$), but you can't improve on the original lens speed.

2. Allow an extra exposure factor—¼ or ½ stop—to take care of light transmission losses in the binoculars.

3. Since the camera lens must be wide open, you adjust for exposure by regulating shutter speeds.

4. Generally, shoot at highest possible shutter speeds, because of greater sensitivity to movement. Use a tripod or monopod whenever possible.

—THE END



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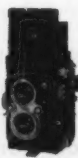
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Entry Forms: L. E. Walton, Jr., 505 East Main St., Richmond, Va.

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Closes: Oct. 6

Exhibit: Oct. 25, 26, Nov. 1

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Entry Forms: Cora A. Gruner, 5952 North Hermitage Ave., Chicago 26, Ill.

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Closes: Oct. 6

Exhibit: Oct. 26-Nov. 9

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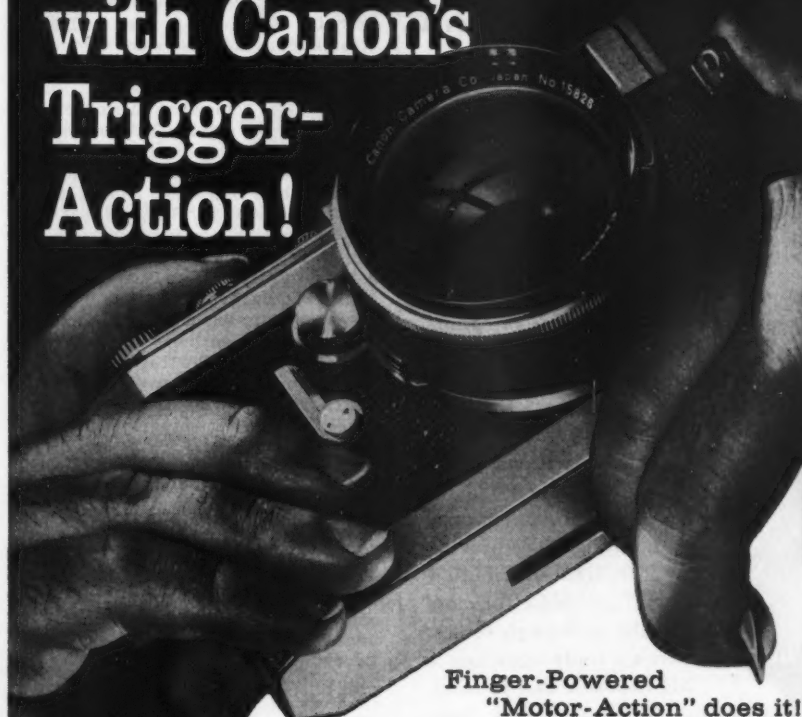
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NEW PHOTO BOOKS

(Continued from page 18)

pocket-size Focal Press Camera Guides. He has done his usual efficient job of telling all about the camera and how to use it in a text which is straight-forward and easy to understand. However, the apparently arbitrary change in type size from page to page is somewhat disconcerting (we found the small, condensed size a bit cramped for reading comfort).

One feature which we have always liked in the Focal Press Guides is the chapter devoted to "Subjects in Front of the Iko-flex" (or other camera)—which lists such typical targets as Animals, Children, Landscapes, Sports, Night Photography, etc., and explains the special problems and techniques which apply to each.

The 16 photo illustrations are unusually well chosen to indicate the variety of material available to the Iko-flex—or any—photographer.—M. T.

YASHICA GUIDE, by Richard Lowell. 128 pages, illustrated. Paperback. Amphoto, New York. \$1.95

Author Richard Lowell answers every conceivable question that the Yashica user, or any 2¼ fan, might present. The subtitle of this guide on one of Japan's most popular cameras might well have been: "All About Everything Pertinent to 2¼ Photography, In Brief." After the first two chapters on "Know Your Equipment,"

IN NEXT MONTH'S MODERN

Lens vs. film designers: who's winning the race?

and "Taking the Picture," the author takes us outdoors, indoors, around the corner and, finally, around the world—with the Yashica.

The book contains the latest information on films, super-slide kits, 2¼ viewers and assorted accessories.

In Chapter 3 on "Black-and-White Films and Filters," the author gives data on the European films as well as on the Eastman Kodak and Ansco films. He groups the films by speed, listing in addition to the manufacturers' recommended exposure indexes the higher exposure indexes which many photographers claim give superior negative quality.

The chapter on color photography includes advice on storing, mounting and viewing—both 2¼ and super-slide size transparencies.

Although some Yashica owners may find the final chapter on "Picture Stories" of interest, we found it to be repetitive, unnecessary and the weakest chapter in an otherwise good guide.—BETTY BROWN

These and other books are available through MODERN PHOTOGRAPHY Book Store; see advertisement on page 47.



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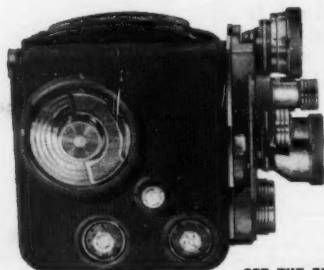
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the CAMERA CLUBS

by MABEL SCACHERI

Bright ideas from clubs everywhere can add novelty to your programs.



Whenever I peruse a bunch of camera club bulletins — and believe me, I do read carefully every one you send in—I always find a lot of bright, novel ideas. For instance, the Mu-

nicipal Photo Club of St. Paul, Minn., has decided that on field trips each member will wear a bright red tam with black pom-pom and Scotch plaid head band, plus a button with the club insignia. That is certainly one way to attract attention to the club and make known its happy existence.

I'd like to know how the Portland (Ore.) Photographic Society made out with a program on a Mike Wallace type of interview on photography. Everybody still friends?

Then there are those shutterbugs who, usually on summer vacation, go out and shoot a flock of slides and negatives and use them as a stock pile for a year. The Fotoclan of St. Louis, Mo., has a tentative plan to require that all prints and slides in contests be no older than three months. I hope the club tells me how well this idea works.

Most clubs are glad enough to have some extra-good color shooter put on a program of slides, but the Castle Craig Color Camera Club of Meriden, Conn., had a really special program from Cliff Bradley, who presented his New England slides with musical accompaniment and excerpts from poetry. Maybe you could persuade some color wizard to soup up his program in this way for your club.

What goes on in the minds of judges will always remain something of a mystery, but I think it is helpful to have a talk occasionally such as "What Judges Look for in Slides," presented by Dr. F. J. Ruch at a meeting of the Color Camera Club of Westchester, New York.

One program idea that works awfully well is to hand out copies of a negative to club members, let each one make a print, cropping as he pleases, and hold a contest, as the Albany (Continued on page 28)

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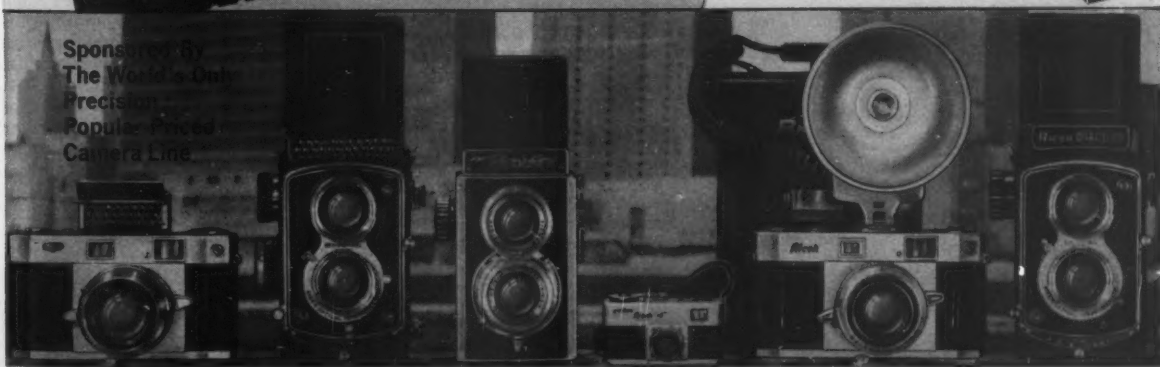


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THE CAMERA CLUBS

(Continued from page 26)

(N.Y.) Camera Club did recently.

The assigned subject is also not used often enough by clubs, for it usually brings out imaginative work, and such a contest is much easier to judge than the customary random collection of pictures. The Austin (Minn.) Camera Club had a contest on "Hands," and "Hands and Feet" was the theme of the Club Fotografico de Mexico, with many excellent prints from the contest appearing in their monthly publication. And what a publication! A booklet, 7 x 9 inches, highly calendered paper with gold on the cover, some 60 pages, full of news, informative articles, even a photographic crossword puzzle. Never have I seen such a deluxe job among camera club bulletins. There were enough ads to pay the cost of this ambitious publication, or so I should judge.

All clubs constantly campaign for new members. The Camera Guild of Cleveland (Ohio) had posters made up, publicizing a color course they were to offer, and each member had a poster put up in some likely spot. In their club bulletin was another good idea on new members. They list those who have recently joined, plus a short account of the photographic experience of each, what cameras they own, what their special interests are.

Bulletins vary

Club bulletins vary a good deal, all the way from simple listings of contest winners and reports on individual activities to really informative articles, either summaries of talks given at the club or articles on technique.

The Boston Camera Club gave a first rate report on a talk by Phillip Solomon about cat photography, who gave this advice: "Never allow the cat's arched back to come up between its ears. I don't know why. Three judges told me so." See what I mean about judges?

The Enchanted Lens Camera Club of Albuquerque (N. Mex.) has a bulletin crammed with information on portraiture, retouching and spotting, including retouching of color slides, and lists of helpful books. Some of the clubs, among them the Greater Lynn (Mass.) Camera Club and the Manitoba (Canada) Camera Club have rental libraries of photographic books. A fine idea, if you can locate a member with great patience and persistence to run the library.

As I was saying, there's variety and surprises in these bulletins. Thank you so much for sending them in.—THE END

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35MM

by JOHN WOLBARST

Standards of technical quality: #1. What you can reasonably expect from your camera and film.

It's easy enough to talk glibly about "technical quality" in black-and-white pictures. The real sweat comes in trying to translate the generalities into specific terms by which one might be able to judge his or her own work for technical quality.

This is the first in a series of columns and articles in which I'll try to tackle this problem. The point of view will be that of the non-professional. That is, we'll be concerned with pictures made for our own pleasure rather than for reproduction, sale, or other commercial purposes.

Let no one think that that implies a low standard—the ardent amateur is very likely to set himself a quality standard involving time and effort which would bankrupt most professional photographers. The non-professional approach also permits a choice of equipment, materials, and techniques which might be awkward or uneconomic for the professional but ideal for us.

Of course, what I have to say will be strictly opinion, based on experience and observation, and anyone is at liberty to disagree.

The end result, the print

Usually, the final aim of our picture taking is a fine print—an enlargement to go on a wall or in a portfolio, or just to file away. Let's now bypass all the steps preceding the final result, and take it for granted that the negative was correctly exposed, properly processed, and printed with a minimum of dust specks, scratches, etc.

Of the many negative characteristics influencing the technical quality of the print, it seems to me that the most important are: the apparent sharpness (or unsharpness) of the image; the look of graininess or the lack of it; the rendering of the various tones, from black through a wide range of grays to white. Speaking in broadest terms, I consider that those areas in the picture which are intended to be sharp should be as sharp as possible (unimportant areas may be unsharp), that graininess is no asset but a defect to be avoided as the plague, that the range of tones rendered should

be consistent with the nature of the subject matter.

Of course, if you wish to deliberately produce unsharp, grainy, soot-and-whitewash prints, no one has the right to deny you the pleasure of so expressing yourself.

How big a print?

To the uninitiated it is startling to see a fine 8 x 10 or 11 x 14 print, and next to it the 35mm contact print. There was a time when "a good 5 x 7 print" was considered to be a sign of achievement in producing a well-exposed and processed negative. Since World War II the standard of "average" excellence has steadily risen, and in the past two or three years the boundaries of possible excellence have expanded incredibly.

How big a print should you be able to make and still retain excellent quality? I would say that the very minimum standard of performance today would be a first class 8 x 10 print from a full 35mm negative (or most of the negative). If you cannot meet this standard consistently (except perhaps for pictures taken under "impossible" lighting conditions) your picture taking and making techniques urgently need overhauling.

You should be able to reach or excel this standard with most of the popular 35mm films now being marketed, including such very fast ones as Ansco Super Hypan and Kodak Tri-X. A moderately careful worker should easily make first grade 11 x 14 prints from even the very high speed films.

As you move away from the very high speed films to the medium fast (Kodak Plus-X, Adox KB-21, etc.) the possibilities for technical excellence go up enormously. It is so simple to make negatives capable of topnotch enlargement to 11 x 14 that inability to meet this standard is deplorable. And please remember that several of these "medium fast" films function ideally with an exposure index of around 200—fast enough for pictures under surprisingly bad conditions, yet not too fast to use comfortably outdoors.

With the next step down in film speeds (to "medium slow" Kodak Panatomic-X, Perutz Perpanic 17 and similar films) the technically excellent 11 x 14 is certainly the minimum standard. And your 8 x 10 prints can easily be mistaken for those made with

larger cameras. Usable exposure indexes in the range from 64 to 100 make these films a good choice for outdoor work, but require somewhat more care in exposure meter use than when working with the "medium fast" films.

I believe that 99 out of 100 photographers will be unable to exhaust the quality potential of the medium fast films. And the medium slow films have boundaries of excellence which 999 out of 1000 photographers can never even remotely approach, let alone exceed.

Of course, there are also the very slow films, such as Adox KB-14 and Agfa 1FF. I consider these to be items for the specialist. A minimum standard of performance with them would be an excellent 20X enlargement.

How to look at a print

Theoretically, an enlarged print should be viewed from a distance approximately equal to the focal length of the taking lens multiplied by the number of diameters of enlargement. Example: Your camera has a "normal" lens of 50mm (two-inch) focal length. A full negative is enlarged so that the narrow dimension (one inch) just fills an 8 x 10 print. That's about 7½X enlargement, with slight cropping of the ends of the negative to fit the 8 x 10 shape. This 8 x 10 print should be viewed from about 15 inches in order to see "correct" perspective, apparent sharpness, and graininess.

More theory. If the 8 x 10 looks sharp and non-grainy at the "correct" viewing distance, then the negative should be capable of equally satisfactory enlargement to virtually any size, provided that the viewer always keeps at the "correct" distance. This is the basis for the well-known effect that most big pictures (and many girls of various sizes) look better the further away you get.

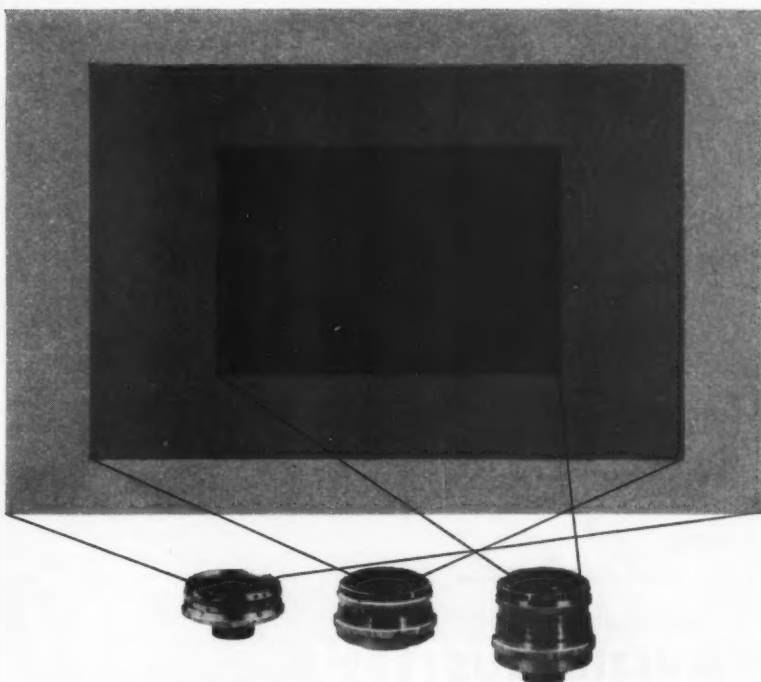
I've seldom seen this "correct viewing distance rule" honored. To begin with, the prevalence of major cropping leaves us with little idea as to how many times the image has been enlarged. Secondly, most people are inclined to select an arbitrary viewing distance of about 15-20 inches for almost any print larger than a pocket snapshot. Third, if the print has much fine detail the viewer is likely to bring it quite close (the distance depends on how his myopia is progressing) and really sniff it over. Finally, after such scrutiny the print goes out to arm's length, where it usually looks fine.

Nevertheless, the "rule" does give us a basis for comparison, and it is not stringent in the degree of technical skill required to meet it. So, the following discussion presupposes the use of the "correct" viewing distance for ferrotyped glossy prints made in a semi-condenser enlarger such as the Leitz Focomat.

How grainy?

There is no doubt in my mind that within each film speed group some makes of film tend to show more grain-

(Continued on page 32)



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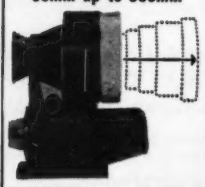
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35MM

(Continued from page 31)

iness than do other types. Without discussing the matter now, let's assume that I'm referring to the films which have less tendency to show graininess.

Graininess should be a very minor problem. That is, unless you get into the business of available darkness snapshooting with forced development to coax out astronomical film speeds.

When fine grain developers are used (Agfa Atomal New, FR X-33B, Kodak Microdol, etc.) even the fastest films can be enlarged to 8 x 10 with graininess patterns which are barely perceptible, and with plenty of film speed to spare, too. Even closer than "correct" viewing of an 11 x 14 should reveal little or no graininess.

Developing high speed films in the more powerful medium fine grain formulas (Clayton P-60, Ethol UFG, Kodak D-76, and similar) will produce higher film speeds but also more graininess. In an 8 x 10 the pattern will probably be visible but should not be strong enough to make you conscious of it. Even with closer than "correct" viewing of an 11 x 14, graininess should not be objectionable, though it is likely to be apparent (particularly with some types of subject matter).

Using medium fast films and fine grain development, graininess should be virtually unnoticeable in an 11 x 14, even at closer than "correct" viewing distance. The semi-fine grain formulas may produce graininess which can barely be detected with close scrutiny of an 8 x 10, but may show up somewhat in a closely viewed 11 x 14.

Suitable development of the medium slow and very slow films should produce an 11 x 14 in which graininess is not apparent to the unaided eye, except with the closest scrutiny, and even then it should be hard to find.

Surprisingly, the differences in graininess between the high speed films and the medium slow films are not as great as you might expect them to be in a "correctly" viewed 8 x 10 or 11 x 14.

How sharp?

The apparent sharpness of a picture is affected by many factors—type of film and development, type of lighting, inherent contrast of the subject, texture, and so on. Nevertheless, all other things being equal, some general principles appear to apply.

The differences in possible sharpness between films of different speed classes are much more pronounced than are the differences in graininess. Using the high speed films, I have been unable to produce an 11 x 14 with apparent sharpness even remotely approaching that to be found in the best of the medium fast and medium slow films.

In an excellent 8 x 10 or 11 x 14 made from high speed film, we can expect the main outlines to be rendered with a good appearance of sharpness. A face

may stand out strongly, eyes may be strikingly outlined—but close examination reveals lack of interior detail. However, there is no valid reason for the main outlines to be unsharp unless it is done deliberately. Closer than "correct" viewing may reveal a breakdown of detail even in the main outlines. Today's high speed films are better in sharpness than ever before, but it is a mistake to expect them to record faithfully fine details in a subject.

Some medium fast films can make an 11 x 14 of astonishingly sharp appearance, with proper development. Interior details of hair, eyes, skin and other parts of the subject are visible. However, don't expect to count pores unless the lighting is designed to emphasize texture.

In an 11 x 14 print made from the medium slow or very slow films the appearance of sharpness can only be described as startling. Some 35mm workers, more skilled than I, tell me that they can distinguish quality differences between various brands of medium slow and very slow films in 11 x 14 prints. I must confess that at that degree of enlargement I am unable to see much difference in the performance of the various brands. And in an 8 x 10 they all look alike to me. However, as you get up into the range of 20X and 30X enlargement, noticeable differences appear.

Incidentally, there is a correlation between the graininess of a print and its apparent sharpness, but I'll have to go into that some other time.

And the range of tones

A final brief word about the range of tones. Except for specialized pictures such as silhouettes or night scenes, the black-and-white medium is dependent on the ability of the film/developer/print combination to record a wide range of intermediate gray tones. In their ability to do this and to differentiate nicely between tones which are not greatly dissimilar, I think the medium slow and medium fast films take the laurels. I know no way to describe what the tones in a picture should be except to say that the rendition ought to be appropriate to the subject matter. However, as a general thing, the greater the variety and range of the middle grays the more successful the print is likely to be in conveying a sense of reality from the subject to the viewer.

So much for a beginning on standards of 35mm quality. No doubt there will be dissenting opinions.—THE END



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A magazine art director discusses
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 shed new light on motion studies.



Mature self-
 criticism and
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 characterized the
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 ference at the
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 Miami, in Florida.
 With the empha-
 sis on planning as

well as creative thinking, a team from
Look magazine demonstrated the
 production of a picture story. Commenting
 on the variety of picture stories, art
 director Allen Hurlburt, of *Look*, broke
 them down into the following five
 categories.

"First, there is the sequence—the
 simplest form of picture story which
 usually covers a small segment of
 time. It should have the same ingredi-
 ents of introduction, development and
 conclusion that go with more elaborate
 stories. In a sequence, the layout may
 create a crescendo effect by a step-by-
 step increase in the picture size.

"As for the news, rather than give
 spot coverage, *Look* substitutes depth
 for timeliness and anticipation for fast
 closing dates.

"In a wide range of subjects from
 fine art to teen-age fads, picture stories
 may be serious or have entertainment
 as their primary purpose." Hurlburt
 categorized these as human relations.

"In articles which deal with social
 problems, many serious subjects are
 presented in a picture story format
 followed by a text piece. The natural
 interest in the visual treatment en-
 hances the reader's interest in the
 serious text.

"Finally, there is the personality
 story—the visit with a major figure of
 our times."

Hurlburt also discussed the use of
 color in picture story presentation.
 Contrary to the common impression
 that color enhances all pictures, he be-
 lieves that sometimes it is actually a
 handicap. This may be a result of a
 reader's being so conditioned to news



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photos that black-and-white pictures are more readily accepted as reality. Or, it may be related to competition with color advertising. "Color can be effective in the picture story, but it must be used with discretion."

He went on to explain how, after the photographer has done his work, the fate of the picture story rests with the art department. On one hand, good layout can give it form and structure and enhance its excitement. On the other hand, a careless, confused, self-conscious, "arty" layout can destroy impact and content.

Hurlburt used slides of a specific story to demonstrate the mechanics of making a layout. He stressed the fact that the photographs should dictate the way a layout is made.

After pages are reviewed and revised, the picture story may be considered for an issue in preparation. Some are accepted. Others are rejected or sent back to the art department for further revision. Some shrink from an ambitious nine pages to a realistic four. Others, inadequate in themselves, may contribute ideas for new stories.

Hurlburt suggested that all photographers should carefully study the layout and structure of picture stories. They should notice particularly the visual presentation—design of the page and cropping of the pictures. In this way, Hurlburt feels, they can learn more about how to produce them more effectively.

Pulsed Xenon arc lamp

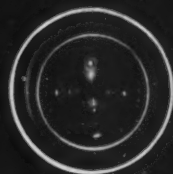
The General Electric Co. has announced a new light source in the form of a Xenon gas discharge lamp which flashes 120 times per second. To the eye, the light is continuous, for the lamp receives a pulse for each half cycle of its line frequency, producing a flash of 1/1000 frequency. (In conjunction with this new development, the American Speedlight Corp. has announced a line of Ascorlux lighting equipment for the G-E lamp.

IN NEXT MONTH'S MODERN

A report on Eastman Kodak's new new Plus-X. How does it differ from the old?

Undoubtedly there will be many applications for such a light source. One that I would like to see explored is the revealing effect created by making a time exposure of a moving object. With a light pulsing at 120 exposures per second, 60 exposures could be produced in a half-second, 12 in 1/10 sec., and so on. Considerable information could be obtained about the actual movement of objects in this way—and furthermore, the resulting photographs could open new aesthetic avenues of abstract photography.—THE END.

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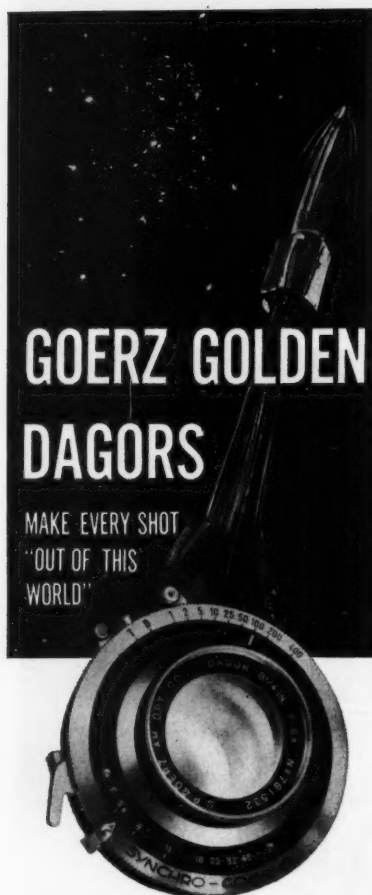
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the LARGE CAMERA

by **ANDREAS FEININGER**

Staff Photographer for *Life Magazine*

Close-ups with your 4 x 5



For close-ups of inanimate subjects of any kind—objects of nature or works of man—no other type of camera can match the ground glass-equipped 4 x 5, for these reasons:

1. Without any mechanical complications, such as bayonet mounts or rangefinder couplings, the large camera can take any kind and type of lens. And since close-ups of inanimate subjects can be time-exposed simply by uncovering and capping the lens, it does not matter if the lens is mounted in a shutter or barrel.

2. Short-focus lenses with focal lengths ranging from one to four inches make the best close-up lenses for the 4 x 5. And since a photographer normally shoots close-ups with the diaphragm considerably closed down to get sufficient depth of field, lens speed, except perhaps for focusing, is of no value in close-up photography. And since as a rule slow lenses, when stopped down, provide considerably sharper results than fast lenses at the same aperture, they make excellent close-up lenses. Also, as everybody knows, slow lenses are usually much cheaper than fast ones. Such lenses are sold second hand from \$10 up.

3. The larger the scale of image rendition, the shorter the focal length of the lens can be, since the covering power of any lens increases as subject-to-lens distance decreases. For example, a lens with a focal length of one inch (originally designed to cover a 16mm motion picture frame) in conjunction with a ten-inch bellows extension will cover a 4 x 5-inch negative and produce an image nine times natural size. Thus, a 50mm lens with a focal length of two inches and an aperture of f/3.5, which second hand costs about \$10, makes a perfect close-up lens for the 4 x 5.

4. Close-up focusing with the 4 x 5 is *always* done on the ground glass, whether the camera is equipped with a rangefinder or not. This, of course, avoids the problem of "parallax"—the difference between the image in the viewfinder and the image as it will appear on the film. The photographer who uses a large camera can always

be sure that the picture will be as he saw it on the ground glass and that no vital parts of the subject will have been accidentally cut off.

5. In comparison to 35mm and 2 1/4 x 2 1/4-in. reflex cameras, large cameras are much slower to operate because it takes time to insert the film holder and pull the slide. For this reason, I do not recommend them for shooting close-ups of animate subjects which may change position or move out of focus. But as far as inanimate subjects are concerned, the time lag is of no consequence and is more than offset by the advantages of the larger negative size, making it superior to smaller film sizes in these respects: 1. Grain is not a problem, standard developers can be used, and the full inherent speed of a negative emulsion can be utilized. 2. If necessary, enlargements up to mural size can be made without objectionable grain. 3. Higher subject magnification is possible by using a "two-stage approach": first, by magnifying the subject on the film to the fullest extent of the bellows extension; then enlarging only the center section of the negative, a process impractical in 35mm films because of the degree of grain magnification.

One of the "laws of exposure" is that, in close-up photography, correct camera exposure is proportional to the square of the distance between lens and film, bellows extension at "infinity" position being equal to the factor "one." For example, a close-up which shows a *small object in natural size on the film* necessitates a bellows extension that is twice as long as the lens-to-film distance necessary to focus the same lens on infinity, and must be exposed 2² (i.e. 2 x 2)—four times—as long as a shot taken under identical light conditions with the lens set at "infinity." In other words, in close-up photography, readings taken from an exposure meter must be modified in accordance with the increase in bellows extension beyond that required to focus the lens "on infinity."

A short-cut to efficient focusing

Now, this sounds much more complex than it actually is. In practice it is very simple to determine, once and for all, the necessary exposure increases for different scales of rendition—the factors by which exposure as determined with an exposure meter must be multiplied—as follows:

(Continued on page 110)

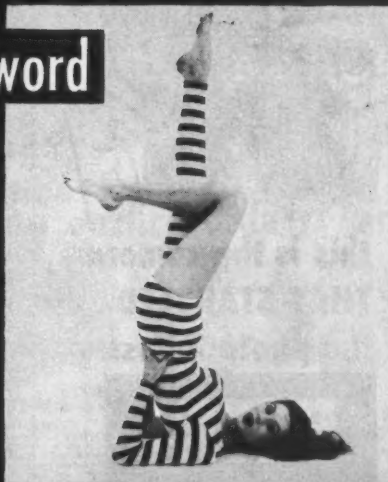
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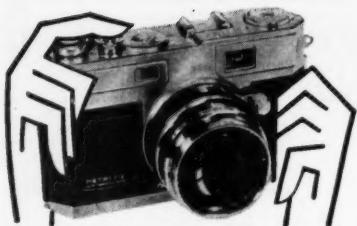
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PICTURES in a MINUTE

by JOHN WOLBARST

Hot where you're headed? Heat and humidity pose problems for Polaroid Land camera users.



Excessive heat is the enemy of all kinds of photographic film. Whether you're just sweating out the still-to-come hottest part of this summer, or are planning a winter vacation

in hot climates, here are some important bits of information. Too much heat and humidity ages any film prematurely, may cause loss of film speed, partial fogging and other defects. But, in addition, heat affects Polaroid Land films in a special way.

As you know, each roll of Polaroid Land film carries within itself the chemicals necessary to develop the picture. The chemicals are in a sort of jelly, contained in long narrow pods (there's one pod for each picture on the roll, and the pod is next to the picture area on which the developing chemicals will be used).

Temperature has a marked effect on the chemicals in the pods. In very cold weather, for example, the jelly gets stiffer and may not spread evenly. And the cold slows down the chemical activity so longer development times are necessary.

When the mercury zooms high, exactly the opposite effect occurs. The chemicals in the pods get practically watery. When you pull the tab (and cause the pod to be squeezed open between two steel rollers) some of the very thin jelly may squirt out the sides of the film and onto the camera body. Here it collects and dries, making a bit of a mess of the camera interior. If some gets on the rollers and dries there they won't be smooth—this causes irregular pressure on the film when the tab is pulled and the usual result is a series of white spots down the length of the print.

So, first hot climate caution: After each roll of film is exposed, glance at the inside of the camera. If it looks pretty sloppy, wipe it out with a dampened cloth, giving particular attention to the rollers.

High heat and humidity also affect your Polaroid prints after the picture has been developed. Prints must be coated immediately or they may start to turn brown and fade. I know this

presents some problems if you are outdoors. For example, if the wind is blowing dust in quantity, it makes no sense to try to coat prints. In that case I would temporarily store the uncoated print in a folded film box (to protect it from scratches, etc.) and coat it at the first opportunity.

Be liberal with the coater—press down on the tab of the print to squeeze out some juice and spread it evenly over the entire print, edge to edge. You can get extra coaters free by writing to Customer Service, Polaroid Corp., Cambridge 39, Mass.

High humidity also slows down the curing of the coating—it may seem dry to the touch, but it's soft underneath. Don't let two coated Polaroid prints come together face to face with any pressure when it's hot and muggy. The two will stick like glue and the only sure way to get them apart without ruining the prints is to soak them in plain white vinegar. So stack your prints face to back.

Finally, this reminder: Don't store your film in the car trunk, glove compartment or on the shelf behind the rear seat. All three places can reach oven temperatures when the car is locked. If you're forced to leave film and camera in a car, remember that the coolest spot is on the floor. Don't leave a box of film lying in the direct sun's rays. And that goes for the camera, too. Keep it shaded. And just for good measure, keep the cutter bar closed at all times except when pulling the tab. This keeps the bright summer sun out of the tab slot and prevents tab slot light leak from fogging your best picture of Aunt May falling off the diving board.—THE END

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RETINA IIC or IIC with Built-In
25-80 Optical Finders, 14.95
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35mm F4 Curtar W.A. lens \$4.00
50mm F4 Longar Tele lens \$4.00

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- Free Exposure Meter

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- 135mm F4.8 Telephoto Lens
- Extension Tube Set for Close-Ups
- B.C. Flashgun
- Leather carrying Case
- Free Exposure Meter

88mm F2 Auto Biotar instead
of F2.8 Tessar, add \$39.50

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NEW products

Exakta Ila Has Meter



The Exakta Light-Meter Ila, an eye-level 35mm reflex camera, has light meter, penta prism, split image rangefinder and a direct optical finder combined in one unit. The unit can be removed and a waist-level finder substituted. The meter shows the correct exposure in terms of f-numbers and shutter speeds. Other features of the new Exakta are: 27 shutter speeds from 12 to 1/1000 sec. and delayed action; MXF flash synchronization; and rotary dial indicating when film is advancing. There is also a new pressure plate said to eliminate scratch danger, and a newly designed take-up spool. Price of the Exakta Light-Meter Ila, with Zeiss Biotar automatic 58mm f/2 lens, is \$429.50. Write:

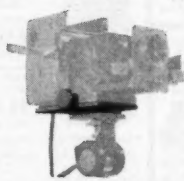
EXAKTA CAMERA CO.
705 BRONX RIVER RD., BRONXVILLE, N. Y.

Edwal Lens Cleaning Liquid

The new Edwal Lens Cleaner is said to have a lubricating action that prevents the sandpapering effect caused by dirt when dry lens tissue is used. The Edwal liquid does not contain alcohol or similar solvents and is available in plastic squeeze bottles with non-spray, one drop applicator tip. A bottle sufficient for 1000 to 12000 cleanings sells for 89c. Write:

EDWAL SCIENTIFIC PRODUCTS CORP.
420 W. 111 ST., CHICAGO 28, ILL.

Mini-Projector Tripod Adapter

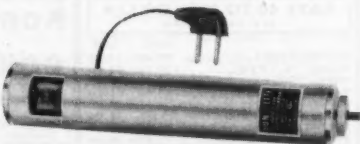


A lightweight frame designed for use with the Minolta Mini-Projector converts your tripod into a projection stand. The adapter may be stored in the same case used for the projector. Price of the

adapter is \$3.95. Write:

FR CORP.
951 BROOK AVE., NEW YORK 51, N. Y.

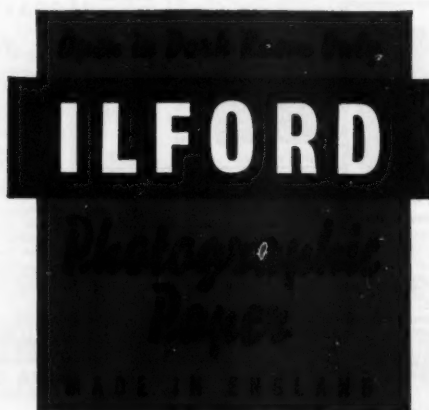
Hershey Flash Tripper



The Sun-Lite Photo Tripper Model PT2 is designed for remote control operation of Hershey electronic flash units, but can be adapted for most other makes. Activating an electronic flash unit at the camera sets off the

(Continued on page 42)

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CONFUSED ABOUT JAPANESE CAMERAS?

READ THIS, BEFORE YOU ANSWER

IS YOUR LENS MADE OF GENUINE RARE EARTHS

The tremendous publicity which certain Japanese cameras have received and also the enthusiastic reception Japanese optical equipment has received from the American public, resulted in an avalanche of new cameras. So many in fact, have been introduced to the American market as to leave the potential buyer in a state of confusion! Many of these products are supplied by unknown manufacturers. And while it is true that many of these imports are good, in our opinion we seriously doubt whether all these products can compete successfully in the American market. Therefore, many of them will disappear soon enough, leaving the owners of such cameras in a position where there is no direct factory representative to whom they can resort for service on their cameras. Not so, however, with the **MARK S-2**. Read on, and discover for yourself, of an amazing development in the importing of fine Japanese cameras.

JAPANESE CRAFTSMANSHIP IS A PROUD TRADITION

The skill and know how of the age-old Japanese is now being directed toward the photographic industry. The resulting products are good. One of the more outstanding cameras, is the **MARK S-2**. Here (at a price, everyone can afford) is a fully automatic camera of the very latest design, equipped with 7 element f-50mm amber coated 1:2 lens of amazing optical quality. A lens which has to be seen and tried, in order to believe its capabilities! Then to top off everything else, there is ample evidence the designers of the **MARK S-2** realized it is function—and not gimmicks the serious photographer desires.

ENTHUSIASTIC APPROVAL EVERYWHERE

The true soul of any camera is its optics! A few years ago, Japanese research laboratory scientists came upon a strange white volcanic earth. After a series of tests, they developed a bubble free glass with amazing physical characteristics. Tagged as being very cooperative, this glass was found to adjust itself to the chromatic aberrations, and to pass light-rays with a minimum of distortion and (above all) be absolutely flare-free! Using all the tools and charts of the physicists, exhaustive tests were made for sharpness and color-fidelity. Yes, here was a series of lenses, they adjudged as superb. But even more startling, when some of their top scientists field tested these lenses, not only did the color pictures permit blow-ups to oversized screens . . . but they actually saw the sharpness was limited only to the grain of the film. And (incredible as it may seem) negatives permitted outsized murals!

IT'S SIMPLE TO USE THE MARK S-2

The rapid-advance "single-stroke" quick-flip-lever is a feature which alone puts the **MARK S-2** years ahead of many other 35's! And, the **MARK S-2** has many features which easily make it the most complete . . . most advanced in the 35mm camera field. For instance, there's a calibrated selftimer . . . an improved shutter-speed dial (nine speeds from one second to one-three hundredth, plus B) . . . penta-iris-blade behind-the-lens-shutter . . . body shutter release; and a **SYNCHRO-RAPID** shutter for perfect flash synchronization. No less important, is the **COUPLED RANGEFINDER** combined with the bright single window viewfinder to ensure perfect composition and sharp focusing on fastest action shots. There's an illustrated leaflet available which explains this amazing candid camera. It's yours . . . free of charge, simply by writing to Dept. M-9-Litt, **STERLING-HOWARD CORP.**, 561 East Tremont Ave., New York 57, N. Y.

READ THIS WARRANTY

Every **MARK S-2** camera is sold with a 30 day trial period and if within this time you are not completely delighted, you may return it for full refund.

In addition every camera is covered by a full 2 year service guarantee, which even includes all parts and labor!

ALL **MARK S-2**'s and their lenses have been put through a long process of testing and checking before being released. Each outfit has been checked and received a seal of approval by the Japanese Institute of Optical Science.

Any G.I. or visitor to Japan knows how really low priced good Japanese cameras can be. Through the normal channels of distribution, many of these products are completely overpriced; once they reach Stateside. The so called normal channels usually consist of a chain of middlemen . . . each adding a certain amount of profit. Sterling-Howard buyer's grabbed the bull by the horns! Experienced,

they know where to buy and how to offer products to camera enthusiasts **BELOW PREVALENT WHOLESALE PRICES!** Comparable List price of the **MARK S-2** is \$124.00!

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ONLY 69⁹⁵ FOR YOUR MARK S-2

Why not try the amazing **MARK S-2** with 7 element f-50mm 1:2 amber coated lens to-day! See if it isn't **EVERY WORD** we say it is. You need never worry about the **MARK S-2**, Sterling Howard's word is behind it!

The **MARK S-2** complete, costs just \$69.95. Price includes a 7 element f-50mm 1:2 lens; coupled rangefinder; 5 blade-iris shutter; single stroke film transport; automatic operation; delayed action timer; Synchro-Rapid flash; and, fast rewind lever. That's because it's made in Japan, yet it is as fine a precision instrument as costly 35mm cameras costing many times more. The demand for this camera in Europe, America and

the Far East is tremendous! So far, our supply is rather good. Yet we have been selling so many of the **MARK S-2**'s that we **CAN-NOT** guaranty to fill your order unless you act at once. So to get a **MARK S-2** for yourself or for a gift, mail the coupon below. Remember, you are fully protected by the Sterling-Howard 30 day trial plan and iron-clad guaranty!

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In December 1957, I purchased your Mark S-2 35mm camera. I want you to know that I like this camera very much. It is the best value I have ever seen.

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J.W.M., Texas

. . . and it sure is the best bargain I ever got in a camera.

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. . . most satisfactory. Please send one more for my wife.

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I want to offer my most sincere thanks, for your fine attention to my order. It's a pleasure to do business with you.

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Mark S-2 with f-50mm 1:2 lens **69⁹⁵**
Metal-rimmed leather overready case **9⁷⁵**
Minilux BC flashgun **7⁵⁰**

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Whether you are a proud parent who simply wants to get better pictures of his offspring—an amateur who wants to make extra money in spare time—or a serious photographer who wants to make a specialty of Child Photography—you will find this book by Josef Schneider extremely valuable. Send coupon below with only \$4.50 for your copy TODAY. If not delighted, return it within 10 days for a full refund.

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NEW PRODUCTS

(Continued from page 40)

tripper, which in turn activates the slave unit. The tripper is activated by direct or bounce light sources. It is said to have worked perfectly at distances up to 50 ft. in moderately lit rooms. The Sun-Lite Photo Tripper mounts horizontally on the Hershey Models 500 or the Sun-Lite II flash head. Price is \$19.95. Write: **HERSHEY MFG. CO.**
4309 WEST LAKE ST., CHICAGO 24, ILL.

Walz Light Value Meter



The Walz EV-LV light meter is designed for use with cameras incorporating the Light Value or Exposure Value system. You set the film speed, point the meter properly and read directly in EV or LV numbers. A click stop rotary tube is set for any of five film speeds from 10 to 200. Price of the EV-LV meter is \$5.95. Write:

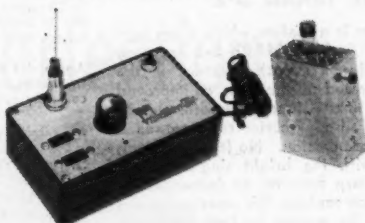
U.S. PHOTO SUPPLY CO., INC.
6478 SLIGO MILL RD., WASHINGTON 12, D. C.

Super Hypan in 4 x 5 Film Pack

Anso Super Hypan, recently announced in roll and sheet film sizes, is now available in 4 x 5 film packs. Super Hypan has a film speed of 500 daylight and 400 tungsten, but may be exposed at indexes up to 1000 daylight and 800 tungsten, or higher, according to Anso. Super Hypan film packs sell for \$3.30. Write:

ANSCO
40 CHARLES ST., BINGHAMTON, N. Y.

Vanguard Remote Control Unit



The Tech Photo Products Vanguard Radio Remote Control unit can be used for a variety of photographic applications. Designed primarily for audio-visual and industrial use, the unit can operate tape recorders, cameras, movie and slide projectors, electronic flash units, flashguns and other types of equipment. The transmitter operates on one 1½-volt and one 22½-volt battery, while the receiver works off 115-volt household current. Complete battery units are available. Transmitter size is 2½ x 1½ x 3½ in., while the receiver measures 5 x 7 x 3½ in. The unit operates on the 27.255 MC Citizens Band, requiring no license. Price of the unit is \$59.95. Audio-visual and industrial models are priced at \$69.95. Write: **TECH PHOTO PRODUCTS, INC.**
1943-5 MCDONALD AVE., BROOKLYN 23, N. Y.

Retina Carrying Case

Either Kodak Retina IIC, IIIC, IIIC or reflex camera can be accommodated, with additional accessories in the new Retina carrying case. The case is made of full-grain cowhide and lined with plush material. Exposed edges are re-

inforced and trimmed with plated metal. The case includes three protective covers for lens attachments (two for 60mm and one for 32mm), hand strap and shoulder pad, and a key for the case lock. Price is \$34.50. Write: **EASTMAN KODAK CO.**
ROCHESTER, N. Y.

Zoom Lens 8mm Camera Outfit

The Ednalite Pro-Zoom lens can be purchased complete with a Keystone 8mm movie camera and leather carrying case. The f/1.9 lens has a range of focal lengths from 9.5 to 28.5mm and focuses from infinity to 3 ft. The camera has 4 fps speeds, is of die-cast metal construction, and has drop-in film loading. Price of the complete outfit is \$299.50. Write: **THE EDNALITE OPTICAL CO., INC.**
200 N. WATER ST., PEEKSKILL, N. Y.

Minox Enlarger with Diffuser

The Minox Model III enlarger has a built-in light diffuser control that can be turned on and off and is aimed at reducing the effect of severe scratches or excessive grain. The enlarger also has a hinged lamp house that can be tilted back for easier access. The enlarger is equipped with an f/3.5 Micro-Minox lens in helical focusing mount, a reversible head with copying arm mount, and dustless, polished chrome film carrier for 8 x 11mm Minox negatives. The light system is adjustable to 110, 120, 220, or 240 volts, with high-low switch and double condensers. Price of the Minox Model III enlarger is \$189.50. Write: **KILING PHOTO CORP.**
267 FOURTH AVE., NEW YORK 10, N. Y.

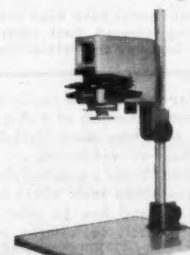
Extreme Tele Lens for Camex

The Tele-Cinor 145mm f/4.5 lens for the Camex Reflex is the longest lens specifically designed for use with an 8mm camera. The angle of view is slightly less than 3° and focusing is from infinity to 10 ft. Approximately 4½ in. long, the lens has a magnification of 12X. Price of the Tele-Cinor, with Camex mount, is \$129. Write: **KARL HETZ**
480 LEXINGTON AVE., NEW YORK 17, N. Y.

Long Ektacolor Rolls

Kodak Ektacolor film is available in 100-ft. rolls of 35, 46 and 70mm widths. The emulsion is similar to Ektacolor Film, Type S, a negative from which slides, color prints, or black-and-white prints may be produced. Kodak offers processing for the long rolls at a charge of 25¢ per foot in uncut lengths of 15 ft. or more. An additional 25¢ charge is made for shorter lengths. The film may be purchased from Kodak professional dealers in a variety of spoolings. Prices for darkroom loading, 100 ft. lengths: 35mm, \$32; 46mm, unperforated, \$43.08; and 70mm, \$64. Write: **EASTMAN KODAK CO.**
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Durst 404 Enlarger



The Durst 404 enlarger is designed for copying, reducing and enlarging, and handles all negatives to super size. It takes up to 100 35mm exposures with the Mirep copy cassette and has easily interchangeable lens boards. Other features are: special Durst lamp socket

for standard opal enlarging, mercury, or projection lamps up to 150 watts; 7 x 7 filter drawer between condensers;

(Continued on page 48)

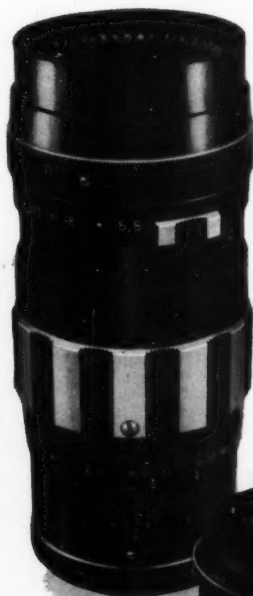
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**ANDRE
Kostelanetz
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**Calendar
Girl**



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Starlight, 10 more

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THE NORMAN LUBOFF CHOIR



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LANIN
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TIFFANY
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TONY BENNETT**



22 Tony with a
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a grand performance

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Doris Day



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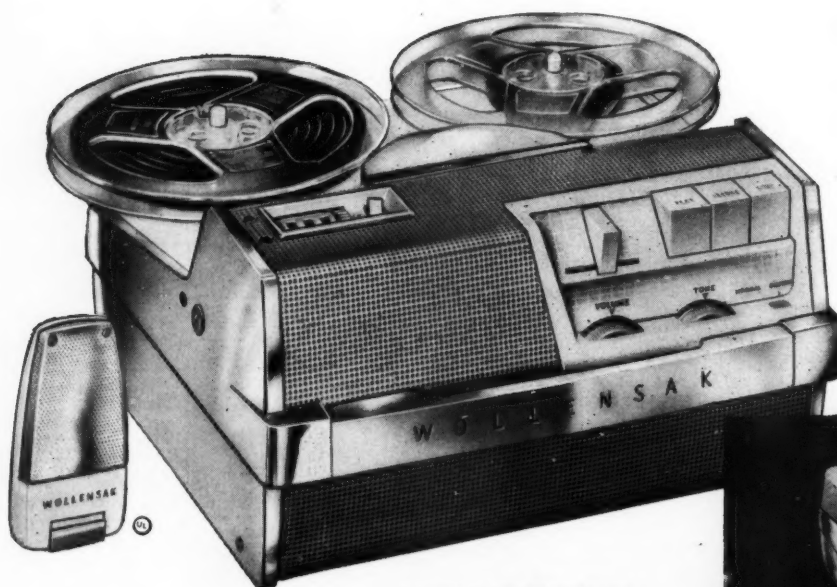
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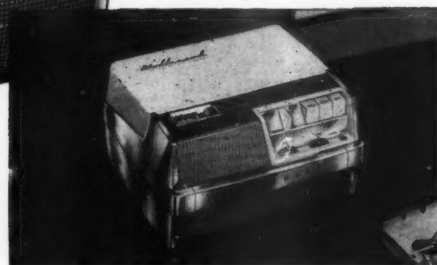
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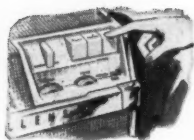
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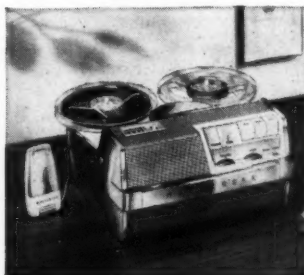


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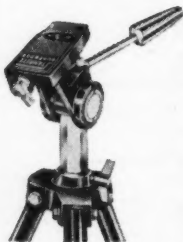
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(Continued from page 42)

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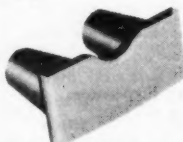
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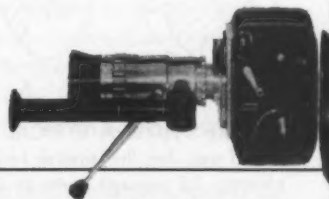
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SHUTTERS

HOW CAN YOU TEST YOURS?

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WHICH IS MOST ACCURATE?

DO BEHIND-LENS SHUTTERS AFFECT LENS PERFORMANCE?

by **BENNETT SHERMAN**

Project & Research Engineer, Farrand Optical Co., New York

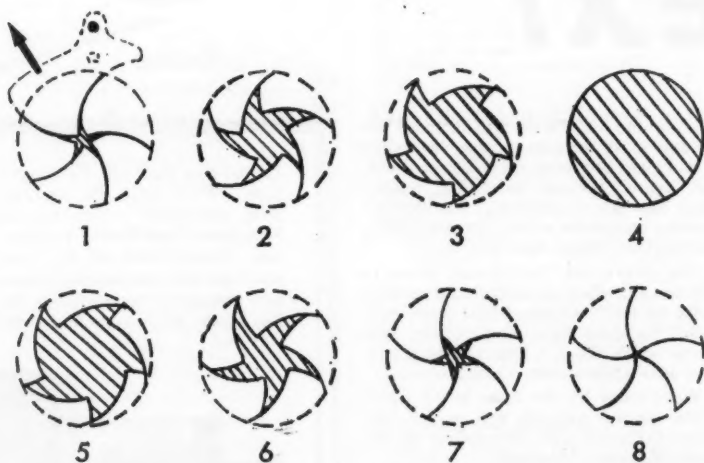
IT'S SURPRISING, in view of the fact that shutters are such an essential part of cameras, that few photographers know much about them. Most people do know that there are focal-plane shutters which look something like a window shade, and leaf shutters whose blades you can often see by looking through the lens. But what are the

good points and faults of each? How can you test them? How do they really work? Frankly, you'll be in a much better position to understand your own camera, or purchase a new one, if you peek behind the chrome front of today's cameras with leaf-type and focal-plane shutters.

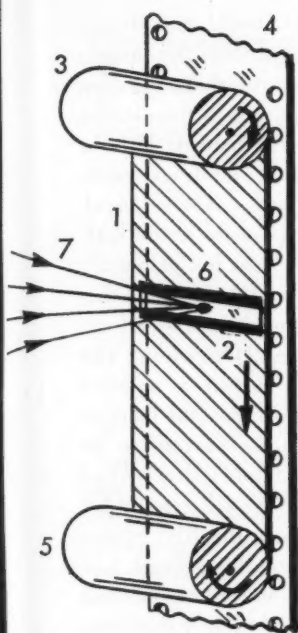
Let's take a look at the leaf shutter first—the

kind that's on most non-interchangeable lens cameras. The theory behind it presents a problem. It takes the shutter a certain time to open and close.

The ideal shutter would expose every part of the picture at the same instant and for the same length of time. The action of opening and closing would be almost instantaneous (a lag in opening and closing causes uneven exposure on parts of the picture). The ultimate in shutters would have no opening and closing action. It would open instantly and then close instantly. Since this is impossible, the compromise ideal shutter should have the least amount of lag in opening and closing. If you could slow down the action of a leaf shut-



1. HERE'S HOW A TYPICAL LEAF SHUTTER WORKS: (1) It takes just .0005 sec. for the shutter to reach a 10 percent opening. (2) Shutter is already 35 percent open at .001 sec. and (3) 70 percent open at .0015 sec. (4) Shutter reaches full opening in .002 sec. (5) At .0025 sec. shutter starts closing but is still 70 percent open. (6) It's 35 percent open at .003 and (7) 10 percent open at .0035. Shutter reaches full closing .004 sec. after it initially began to open. Shutter speed shown here is 1/500 sec.



2. SIMPLE FOCAL-PLANE SHUTTER: Curtain (1) with fixed slot (2) rolls up under tension on starting roller (3). When released for exposure of film (4) the curtain unrolls rapidly from starting roller and winds on take-up roller (5). As it goes from first to second roller the slot (2) moves rapidly past film, exposing various points (6) by allowing light beam from lens (7) to fall on film for brief instant.

ter you would see (Diagram 1) that at certain times after the start of the opening action only part of the light passes through and reaches the film. If you use a small aperture, the film gets all of the light, starting at the time the shutter starts to open until it is almost entirely closed. When you use a large aperture, the center of the picture gets more exposure than the edges. Shutter speeds are computed by measuring time from when the shutter is half open to when it is half closed. This is an understandable compromise. Even with this mechanical difficulty, modern leaf-type shutters, such as the Compur Rapid, Seikosha, Prontor, Copal, and others, come close to being ideal (pretty close anyway). The next problem: what is the best place in the camera to put a leaf shutter? In theory it should be positioned between the lens elements, close to the point where the light rays cross. Most cameras do have their leaf shutters pretty close to this ideal—except for the behind-the-lens leaf shutter cameras which have been specially designed for lens interchangeability. We'll discuss them and their problems later.

Why they switched to the focal plane

If the leaf shutter is so good, why use anything else? This question was answered early in the history of camera manufacture. Leaf shutters

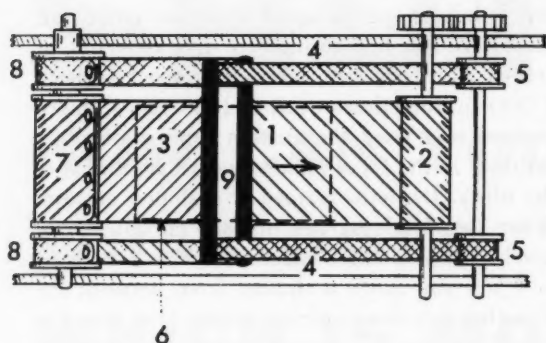
could deliver speeds up to a certain point, but they were not fast enough to stop all types of action. For very fast action you need at least 1/500 or sometimes even 1/1000 sec. Camera makers also tried the curtain type shutter, locating it in the focal plane (that is, right next to the film). Its main feature is a slotted curtain. When the slot is narrow and the curtain moves quickly, high shutter speeds result.

When you move a shutter from between the lens elements to a point behind the lens, near the film plane, you have another advantage. You can now interchange lenses.

The focal-plane shutter presents three problems (Diagram 2). First, the film is not simultaneously exposed over the entire picture area. Points on the film near the take-up spool are exposed some time after points near the starting spool of the curtain. Secondly, at higher shutter speeds, the curtain slot speeds up as it crosses the frame. So a point near the starting spool will be exposed somewhat longer than a point near the take-up spool. This exposure variation may be visible in color photography. However, modern focal-plane shutters can be designed to compensate for this exposure variation. A little later we'll show you a test you can make to check the accuracy of this compensation in your own camera. The third drawback: the focal-plane shutter may create peculiar tilts in large moving objects being photographed. The direction and amount of tilt depends on how the object moves in relation to the direction of the curtain movement. By making the shutter curtain move faster, a wider slot can be used for any given exposure speed, and this tilt effect reduced.

All of these shortcomings of the focal-plane shutter are, in the eyes of many manufacturers and camera fans, more than compensated for by the fact that lenses can be changed if the camera has a focal-plane shutter.

The early focal-plane shutter, as on the Graflex cameras, had fairly simple internal mechanisms, although setting them to the proper speeds was not so simple. The shutter itself consisted of a single curtain with different slots using various spring tensions. Instead of simply twisting one dial and selecting a particular shutter speed, as you would do on a modern camera, you actually had to select a slot width and then the appropriate spring tension, the combination of which made up



3. HOW A MODERN FOCAL-PLANE SHUTTER WORKS:

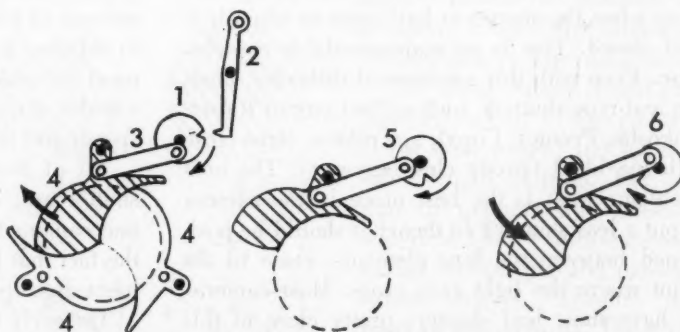
The curtain is divided into two parts—leading edge curtain (1) winds onto take-up spool (2), trailing edge curtain (3) is pulled by its straps (4) which are taken up by two smaller spools (5). Width of slot, which determines actual exposure time for any point in the frame (6) is set by presetting positions of starting rollers (7) and (8). Slow speeds are obtained by delaying close of trailing edge curtain. Take-up rollers (2) and (5) are geared together. Therefore, since the smaller spool is smaller in diameter, the trailing edge curtain lags a little, which causes the effective slot (9) to widen as the curtains cross the frame (6). This compensates for exposure error caused by the curtain's speeding up as it nears the end of the film frame.

a certain shutter speed. The speeds were selected or set by using various combinations. For the highest shutter speeds, the slots were frequently as narrow as one eighth of an inch. Here were the drawbacks: Exposure variation occurred with these shutters. Also, it was difficult to get extremely slow speeds. Lastly, the shutters were not self-capping—that is, when you rewound the slots onto the first roller, the open slot passed again in front of the film. With some types of camera, you had to put a slide in the holder in front of the film while rewinding. Other camera manufacturers devised other mechanical ways of blocking the light rays from hitting the film. But the solution was far from perfect.

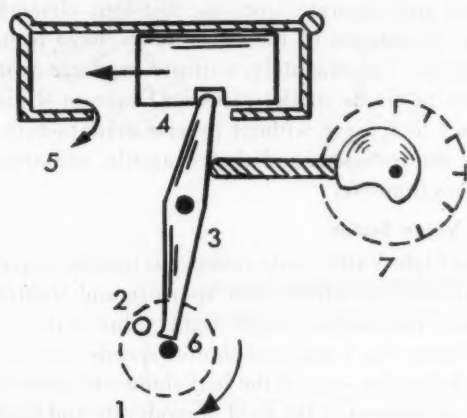
Today's focal-plane shutters (Diagram 3) have two curtains—one forms the first or leading part, the other the second or trailing

part. Slow speeds are easier to build in with this design. In Diagram 3 the two halves of the curtain are placed on two separate parts of the starting roller. The timing mechanism delays the closing of the trailing curtain after the leading curtain has opened the film to the light. The delay mechanism found in most of today's 35mm focal-plane cameras is similar to that used in the leaf-type shutter (see Diagram 6), but it's primarily for the slower speeds up to about 1/50 sec. Variation of exposure, caused by the curtain speed-up, is almost completely eliminated. Here's how: The take-up roller of the trailing curtain is smaller in diameter than the rollers which pull the leading curtain. This causes the trailing curtain to be pulled across the film somewhat more slowly than the leading curtain. Therefore the slit gets larger as the curtain speeds up across the film plane, and the film is thus exposed equally overall. Unfortunately, this solution is not quite perfect since curtain speed-up is not completely uniform. Later on we'll see how this correction can be checked by using an exposure meter and a flood lamp.

There is one rather different shutter curtain. The Contax camera has a shutter (made of narrow, linked strips of metal) which moves across the short dimension of the 35mm frame. Since the actual shutter travel distance is not as great as on other cameras, the shutter doesn't have



4. MECHANICAL ACTION OF LEAF-TYPE SHUTTER: Here's how a single continuous turning motion of a wheel causes the shutter blades to swing open, stop and then close in the opposite direction. Actuating wheel (1) has been wound back under tension against a spring (not shown). When you press shutter release (2) wheel is released. Wheel turns in direction shown and pushes arm (3) forcing blade to swing open. Shutter blades (4) are connected by a link ring (not shown) which causes all blades to swing open. Actuating wheel (1) continues to turn and passes full open position (5). Wheel turns further (6) causing blades to close and end exposure.



5. OLD COMPOUND SHUTTERS USE AN AIR CYLINDER: Shutter blade actuating wheel (1) turns and opens shutter. Timer pin (2) on wheel strikes delay arm (3) causing air piston (4) to move. As air escapes from cylinder (5) actuating wheel turns slowly until pin slides off catch (6). Wheel continues turning rapidly and closes shutters. Exposure time is set by calibrated knob and cam (7) which limits initial position of air piston.

time enough to speed up measurably as in most cloth curtain shutters. Therefore the Contax shutter doesn't need exposure compensation and doesn't have it. So much for focal-plane shutters. Let's get back to the leaf shutter.

Today's leaf shutters

Except for some early or simplified shutters, most shutters today are powered by springs and have three or more blades which swing open, stay open a certain time, and finally close in the opposite direction (Diagram 4). The older air-cylinder Compound shutters (Diagram 5) produce speeds from 1 sec. to 1/200.

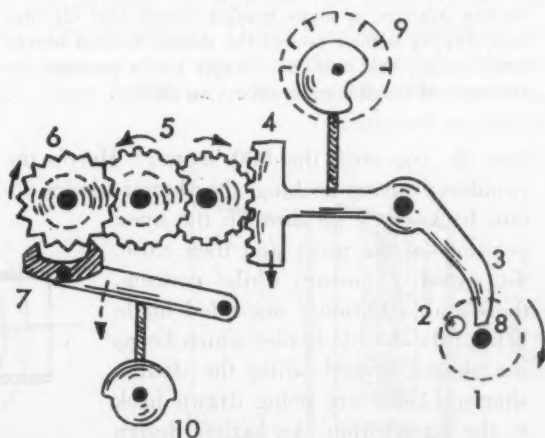
Changes in atmospheric humidity and temperature affect the accuracy of these shutters. Clearance between the cylinder and piston varies with the weather, altering the air escape time. Unpredictable shutter speeds may result. This shutter is extremely susceptible to dirt and dust. In spite of these problems, the air-cylinder timed Compound shutters work.

The modern Compur-type shutter (Diagram 6) using a gear train and a cog-wheel escapement, came into general use in the 1930's. Virtually all modern leaf shutters are based on this design. In fact, such widely divergent shutters as the

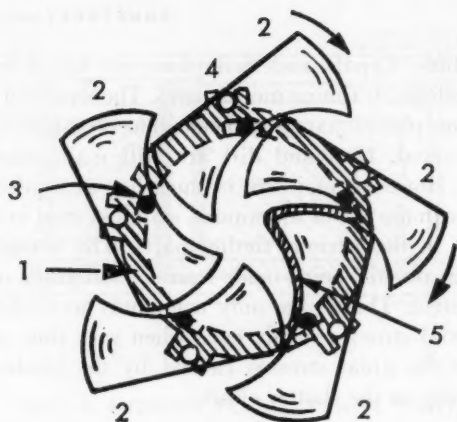
Prontors, Copals and Seikoshas use the same basic delay or timing mechanisms. The sensitivity to atmospheric change has been almost completely eliminated. Dust and dirt are still major enemies. However, moisture is much less of a problem with the use of aluminum, stainless steel and brass in the various timing parts. The shutter blades are still being made from a good grade of tool steel. This is the only commonly available material strong enough, even when very thin, to resist the great stresses caused by the blades' stopping as the shutter closes.

Getting higher shutter speeds

Because the shutter blades have to reverse themselves in going from open to closed, the Compur-type shutters have an upper speed limit of about 1/500 sec. They cannot operate at higher speeds without shortening shutter life. The Kodak 800 shutter solves this problem. It replaces the reverse-travel leaf (Compur-type) with a rotary blade. One half of the blade opens the shutter, and the other half closes it. The basic problem:



6. MODERN LEAF SHUTTER USES GEARS: For slow speeds, shutter-actuating wheel (1) turns, opening shutter. Timer pin (2) strikes gear sector arm (3), causing gear sector (4) to spin gear train (5). Cog wheel (6) at end of gear train starts to spin, but is forced to turn slowly by escapement claw (7). When timer pin (2) slips past catch (8), shutter-actuating wheel turns rapidly to close shutter, ending exposure. For timing of high speeds, escapement claw (7) is pulled back and speed is determined by how fast gear train and free-running cog wheel (6) can be spun. Time of exposure is set by calibrated knob and cam (9) and high-low speed indicator (10).



7. RADICAL LEAF SHUTTER PRODUCES HIGH SPEEDS:

Here's how the Kodak "800" leaf-type shutter is able to achieve speeds up to 1/800 sec. When you release shutter, actuating ring (1) starts to turn. Each double-blade leaf (2) pivots at a stationary point close to rim of lens aperture (3). Actuating ring pushes on drive pin (4) of each leaf, causing leaf to rotate, opening shutter. Actuating ring rotates further, causing other side of each leaf to swing into lens aperture, closing shutter and ending exposure. When the shutter is reset by rotating the actuating ring and shutter blades back to starting position, a single-bladed shutter leaf (5) situated directly behind one of the double-bladed leaves stays closed. This additional single blade prevents an exposure of the film while recocking shutter.

how do you cock the 800 shutter? Here's the problem: during cocking, the shutter blades rotate back (they go through the open position on the way) and then close. To avoid exposure while cocking, there's an additional one-sided blade behind the double blades which keeps the shutter closed while the double shutter blades are being drawn back to the set position. An earlier design of this type of shutter was developed by Gustav Dietz in the United States more than 35 years ago. Not until Kodak introduced the synchro 800 was this design given practical consideration.

What's the behind-the-lens story?

Because between-the-lens shutters make lens interchangeability difficult, and expensive, an alternate shutter position has been used in many modern

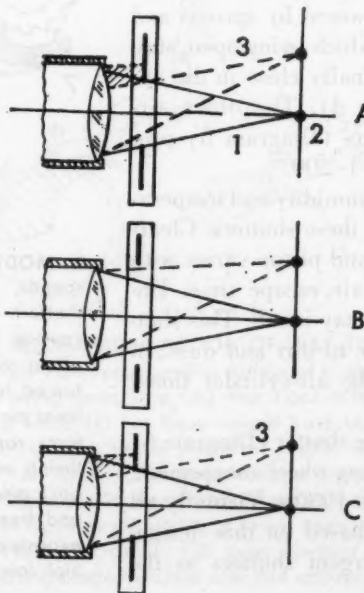
cameras. By placing the leaf shutter in the camera behind and separate from the last lens element many advantages of the leaf shutter have been preserved. Unfortunately, uniform exposure over the entire frame of the picture (Diagram 8) is difficult to achieve without precise manufacture. If the shutter opens and closes rapidly, uniformity does improve.

Light Value Scales

The Light Value Scale system has become popular. Instead of setting both aperture and shutter speeds, you use a single light value number. Combining the f-stop and shutter speeds into one adjustment has caused the leaf shutter to become more prominent in the field of moderate and high priced 35mm cameras. In order to make this system possible, a diaphragm had to be used (containing up to 24 leaves in some shutters) which would have evenly spaced f-numbers so the f-stops and shutter speeds could be combined into one series of adjustable setting rings. Focal-plane shutters are much more of a problem as far as LVS is concerned. To date, none of the 35mm cameras using the focal-plane shutter have incorporated the LVS system.

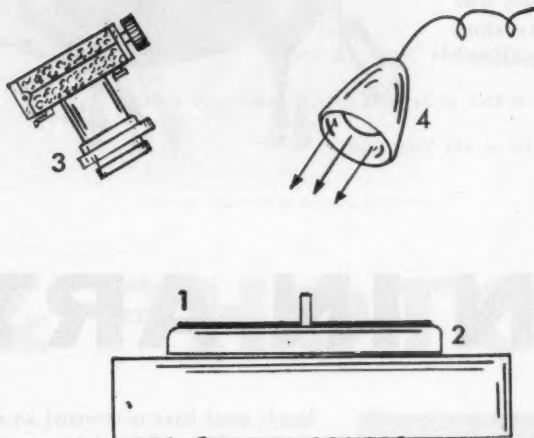
Flash synchronization

Most modern shutters are synchronized for flash. First the flash contacts must close, starting the bulb ignition. Then there must be a delay before the shutter starts to operate. This delay is adjustable so that the flash will ignite at a correct



8. WHY PICTURES MADE WITH BEHIND-LENS LEAF SHUTTERS MAY SHOW EDGE FALL-OFF:

At all shutter speeds, but particularly fast ones, the effective exposure of the edge points is reduced. Here's why: Although light beam (1) to central point on film (2) is unobstructed as shutter opens (A), beam to edge point (3) is partially blocked, reducing light intensity. When shutter is fully open (B), both beams are unobstructed. When shutter closes (C), light beam to edge point on film (3) is again partially blocked. This fault can be lessened by proper designing.



9. YOU CAN MAKE THE LEAF SHUTTER TEST: Place special chart (1) (see text) on 78 rpm phonograph turntable (2). Place camera (3) so that it's sharply focused at a 3½-foot distance. Set it at its highest possible speed. Light turntable with a No. 1 flood lamp (4). See text for direction on making and interpreting results.

time interval ahead of the instant when the shutter is fully open. The focal-plane shutter presents special problems. Most wire-filled flash bulbs do not stay at near full intensity long enough to permit uniform exposure over the full frame during the time it takes the slot to travel across the entire film plane. Specially made wire-filled flash bulbs, having somewhat less brightness and total light output but longer duration of full intensity, are available. For electronic flash, synchronization with a focal-plane shutter becomes a problem. You can use the electronic flash only at those speeds in which the shutter is completely open. In most modern cameras having focal-plane shutters, the top speed usable for electronic flash is approximately 1/30 to 1/60 sec.

Special shutter designs

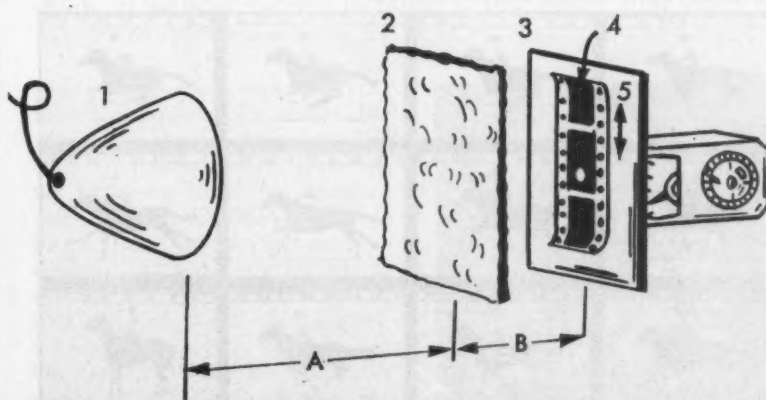
Don't think we've covered all the shutter designs. There are many others somewhat less widely used. Let's look at two of the more interesting. The revolving fan-type

shutter in the Mercury utilized the rotating shutter of the motion-picture camera, but altered the shutter to permit a wide range of exposure. Some of the less expensive earlier cameras used the so-called "automatic" shutter. Typical was the Ibsor shutter and an entire series developed by Gauthier in the 1920's. These were designed to set and release by operation of one lever stroke. Speeds as high as 1/200 sec. were achieved with only two or three shutter blades.

Tests for timing

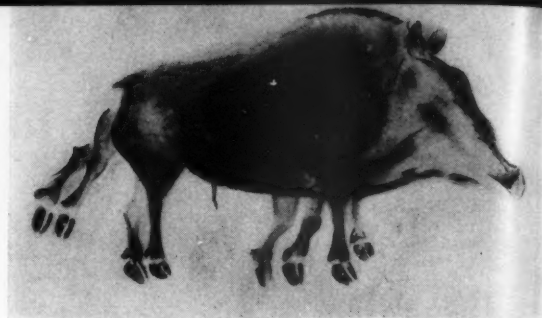
Although only a good repair shop has the wherewithal to test the shutter for speed accuracy, you can run a series of tests at home to check your leaf shutter for time lag. First draw a circle 9¼ inches in diameter on cardboard or paper. Draw lines from the circumference to the center allowing ⅜ inch space between the start of each line at the circumference. The lines should be dark and thin. Try India ink. Cut the circle out and center it carefully on a phonograph turntable which can revolve at 78 revolutions per minute (the old, fast speed used before LP records came in). Now set your camera to any speed over 1/200 sec. Direct the floodlight at the turntable so you can properly expose the film at least 1/200 sec. with maximum lens opening.

(Continued on page 94)



10. FOCAL-PLANE SHUTTER TEST: Place flood lamp (1) near a piece of diffusion material such as tissue paper (2). Right behind paper (B) position a sheet of thick cardboard with a one-quarter inch hole in its center (3). Place an exposure meter about a half inch or so behind the hole in the heavy cardboard. Place the test film (4) in front of the hole so that one edge of the exposed frame is directly over it. Adjust the distance between the flood lamp and the tissue paper (A) until the meter needle rises more than one half of its full swing. Results are obtained by moving the test 35mm frame past the hole in the cardboard (5). See text for interpretation of test.

Prehistoric walking boar, Altamira, Spain, was painted over earlier version. Do extra legs suggest motion?



COURTESY MUSEUM OF NATURAL HISTORY

MOTION IN ART

HOW DOES A HORSE gallop? Are its feet arched fore and aft, all off the ground at once, as the print makers Currier & Ives would have us believe? Bets have been lost on this question which only a photographer, Eadweard Muybridge, was able to prove in the 1870's.

Aesthetically, does it really matter? The "truth" about the path of motion does not necessarily equal the emotion of motion interpreted on canvas or film. The action may be stopped still, or seen as a blur, or a series of multiple exposures. Indeed, the visualization of motion has piqued the curiosity and tested the talent and imagination of artists for centuries. Even

today the argument rages between those who are faithful to detail, and those who are permissive in technique for the sake of effect.

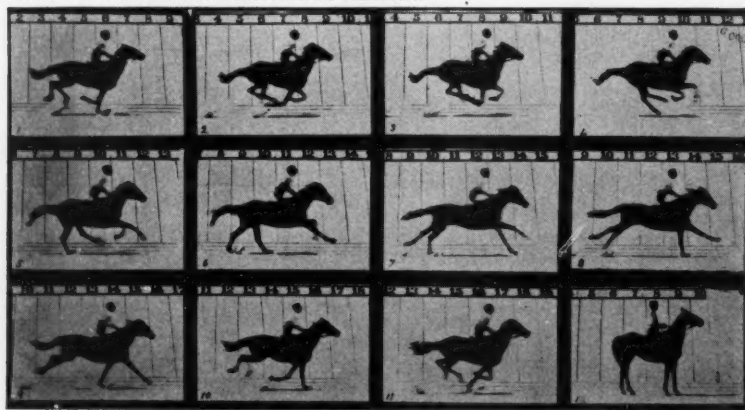
On large canvas battlefields, violent motion has been stopped in midair, generals reared in their stirrups, much as if frozen by the fastest flash of light or shutter speed of a modern camera. Often the result has been quite static, even if overwhelming with its minutiae. Why such an approach? Undoubtedly this was the painfully earnest path to classic realism, where a mastery of drawing technique was the only allowable way to "do a painting." Yet, in trying to make details as true to life as possible, many painters'

hands must have contracted an acute cramp, if not downright paralysis!

"Leaving much to the imagination" is a tired, but nonetheless valid, idiom. "Leave out details!" "Let the viewer infer the sweep of action!" Such thoughts have been voiced again and again to aspiring painters and photographers. And so motion has often been depicted as a blur—the quick bold generalized line or brush stroke that suggests the whirling skirts of dancing girls (Renoir), or the gyration of a horse (Goya).

Today, photographically, a bird in flight (page 69), or a tennis player who starts a serve (opposite page) blur excitingly at the setting of a slow

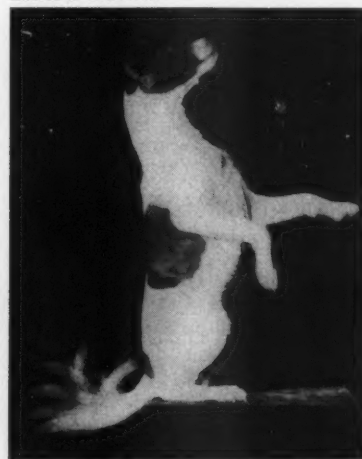
COURTESY EASTMAN HISTORICAL PHOTOGRAPHIC COLLECTION



To prove bet in the 70's that horse's legs were all off the ground at once during gallop, Eadweard Muybridge lined up many cameras along track. Horse broke strings that tripped shutters. Legs were proved off ground, but were bunched together (third frame, top) instead of hobby horse pose. The Futurists proclaimed in 1909: "... forms in movement ... follow one another like vibrations in space." In 1912 Giacomo Balla painted *Leash in Motion*, right. Compare it with Edgerton's photograph of some 30 years later at M.I.T.

COURTESY A. CONGER GOODYEAR COLLECTION AND MUSEUM OF MODERN ART ▷

HAROLD E. EDGERTON



How do you visualize the path of motion? Does "freezing" it make it convincing? Is it a series of vibrations in space? Or a blur? Story based on research by Fritz Neugass

& PHOTOGRAPHY

shutter speed. Or, a background recklessly swirls when the photographer has panned with his subject (girl on carousel, page 63).

If these are liberties which no painter or photographer has any business taking, then the world would be full of still-lives: the basketball would hover above the basket, never to score; the high jumper would be nailed as a permanent fixture against the sky! What credence could be given the work of the Futurists, those early 20th century pioneers who, at their easels, executed a kind of hand-painted multiple exposure?

For here is a third approach to the interpretation of motion, and one that's by no means new. On the walls of a cave in Altamira, Spain, are primitive attempts to document an aspect of a cave-dweller's life. ("Primitive" by some standards!) Among these, a walking boar (top, page 56) is equipped with eight rather than the usual four legs. Is it an accident? Is it a deliberate attempt to suggest the *motion* of the legs in the process of walking? Although the painting that exists on the cave wall was made over a previous painting (which accounts for the extra set of legs), it seems unlikely that the early artist would either have painted four more legs, or deliberately left the old ones, without good cause and imagination.

Similarly, Balla and Duchamps are examples of the Futurist painters who "saw" motion as a series of multiple exposures (see *Leash in Motion* and *Nude Descending a Staircase*, these pages). Compare them to the electronic flash studies of a wagging tail and forehand tennis stroke, by M. I. T.'s eminent Harold Edgerton. Note, too, that the *Leash* and the *Nude*



HAROLD E. EDGERTON



TOM BURNSIDE

Does frozen movement always destroy the feeling of action? Stopped 60 times per second, tennis forehand drive, left, echoes the "vibrations" of Futurist Marcel Duchamp's Nude Descending a Staircase (1913), below. At the other extreme, technique of slow shutter gives added momentum to 1958 tennis serve, top right.

antedate Edgerton's experiments by more than a quarter of a century! But what of the future of motion? Will these now traditional ways of expressing it be supplanted by something even further afield? The painters can forget "form" entirely, and resort to combinations and juxtapositions of color to convey the excitement and idea of motion. For the photographer, it's perhaps less easy. He may open the shutter and swing his camera (or a subject) at the end of a rope, and produce a grand array of amorphous colors on one frame of color film. But how much is at his immediate control?

At the other extreme, could there be a return to the simplest line itself? Can a single pen stroke, or photograph of a coil of wire, convey the energy of motion? Much depends on the skill of the viewer, as well as the painter or photographer!—THE END



COURTESY WALTER C. ARENSBERG COLLECTION AND MUSEUM OF MODERN ART

WHAT SHOULD YOU KNOW TO SHOOT ACTION?

Focal-plane shutter, electronic flash produce this result.



Remedy: High shutter speed and flashbulb with same shutter.



1. DAYLIGHT, FLASH OR ELECTRONIC FLASH?

Since many pictures are made indoors and you can never depend on bright sunlight every day outdoors, you must learn to control your own lighting for consistently good action shots.

Briefly, we deal with flash and electronic flash, the problems of use and misuse. Every modern camera today is synchronized for both flash and electronic flash. You've probably been told many times about the extreme short flash duration of the electronic flash. In theory it should permit you to make pictures with remarkable clarity. Unfortunately, it isn't always that simple. The top photograph at left was made with electronic flash and an expensive focal-plane shutter 35mm camera. What happened? With a focal plane shutter, electronic flash only works at 1/30 to 1/60 sec. The existing daylight registered a second or ghost image, blurring the picture. The photograph below shows how action can be stopped with the same camera and a focal-plane (No. 6) flashbulb. Here the photographer used 1/1000 sec. If you have a focal-plane shutter camera, try flashbulbs (No. 6 or No. 2) if there is a fairly high level of already existing illumination. Save the electronic flash for really dark, low-lighted subjects. With a leaf shutter you can choose your weapon—flash or a electronic flash. The mechanics of this shutter type are more ideal for synchronization. Use 1/500 or 1/1000 sec., if possible.



Use top speed, 1/500 or 1/1000 sec., for parallel action.



At 45° angle, you'll really need the same shutter speed.



Sometimes, if action is directly at you, 1/250 sec. will do.

PHOTOGRAPHS BY MAYNARD FRANK WOLFE

2. IN WHAT DIRECTION IS THE ACTION GOING?

It's all very jolly for experts to insist on a fast shutter speed when the subject is moving parallel to the camera, a medium shutter speed when the action is going or coming at a 45° angle and a slow shutter speed when action is moving directly at the camera. And if you were to photograph an electric or diesel train (on a straight track, of course) it might even work out that way. Other subjects, however, being the unpredictable things they are, introduce problems. The little girl in the three pictures, *left*, is moving at given angles to the camera (secret: we asked her to). However, her arms are moving at one speed, her feet at another, her body at a third. Now we ask you, just how much does angle have to do with stopping all of her?

This motion within motion (technically called "erratic" motion) plus the natural bent of little girls, football players and pet dogs or cats not to follow precise lines of action, fouls up the most comprehensive action-shutter speed chart.

Then what's the good of such charts and why did they come into being? Perhaps the answer lies to some extent in the changing nature of our subject matter. Years ago, when films were very slow (lenses too), getting sufficient light for high shutter speeds to stop racing trains or ten-day bicycle races was often impossible. Thus the tables were formulated. With a lowest possible shutter speed taken from a table, you could stop the train or cyclist—well sort of, anyway—but the wheels of the train or the cyclist's legs were often blurry. But, the main action appeared stopped. Today we think of stopping action in terms of high shutter speeds, fast film, electronic or regular flash. Our subject matter is more often of the more human kind. (Little girls do not run on railroad tracks.)

Although you may be able to get away with a slightly slower shutter speed when your human dynamo is racing forward (lowest photo) you risk a blurred hand, fuzzy hair or a not-too-sharp foot. There is only one sure rule for stopping action from *any* direction. Use the fastest shutter speed possible. A little girl can be stopped nicely at 1/500 sec.



Complete blur at 1/25 sec. best achieves *feeling of motion*.



Panning at 1/100 sec. blurs back, gives fairly sharp subject.



At 1/500 sec. all movement is stopped. Is the result good?

3. DO YOU BLUR, PAN OR STOP ALL ACTION?

As has been said elsewhere in this issue (pages 62 to 77), there are three ways to show motion—stop it, blur it, or pan with it. Without going into the details, we can say that a fast shutter speed will stop all action, a very slow one will blur it and an in-between speed will serve nicely for panning—that is, following the movement of the subject with your camera. Now the question: what speeds are “fast,” “slow” or “medium”?

Let's start with “fast” first. Fast should be just that. If the top speed of your camera is 1/1000 sec. and you are sure your focal-plane shutter is really working well at that speed, use it. If 1/500 sec. is top on the shutter dial, use it. Speeds lower than that cannot be relied upon to stop the types of action most of us try to photograph—people, automobiles, pets in action. A speed of 1/25 sec. seems to be ideal for panning. Backgrounds are blurred, but not so unsharp that they are unrecognizable. Subjects are adequately sharp even though a hand or foot may not be rendered completely sharp.

The quality of motion is best preserved by either pan or downright blur. Why? Simply because that's the way we really see action. Although we *think* we see sharply, we don't see objects in motion sharply at all. And when we follow a subject with our eyes, we do just what our camera does, we are actually panning. Psychologically, the blurred or pan shots thus approximate far closer what we really see than frozen action.

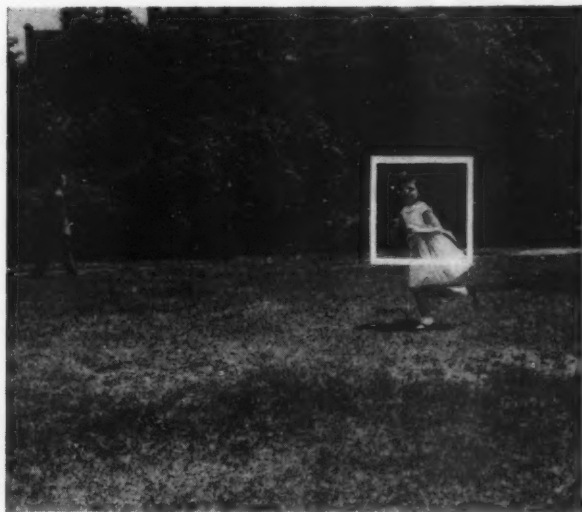
A great deal of nonsense has been written about the panning technique. By panning, you *don't* usually produce a blurred background and a needle sharp moving figure. You often get a blurred background and a moving figure part of which is acceptably sharp. Let's take a closer look at the middle picture at *left* in which the photographer panned with the girl, shutter speed, 1/25 sec. The movement itself is evident. The figure isn't blurred, but it certainly doesn't have the sharpness of the bottom picture. Hair, arms and legs are even less sharp.

For everyday action shooting, try using the deliberate blur to achieve a true feeling of motion without complete subject identification, and the pan shot to show motion when the identity of the subject is important.

At close distance 1/100 is too slow to stop action sharply.



Same 1/100 seems to stop action at farther camera distance.



Enlargement of subject, however, proves it's not so.



4. WILL SLOW SPEEDS STOP DISTANT ACTION?

While exploding various theories on motion photography, let's lastly take a crack at a widespread misconception that you can stop action from a distance at a much slower shutter speed than you can if you are near your subject. It isn't so, but it doesn't take long to realize why everyone thinks it is so. Example: You are 25 feet from a jet going by at 600 miles per hour. When you take a shot at 1/50 sec. you get a blur. Now you are on the ground photographing the same jet flying 600 mph one mile up in the sky. It seems to move much more slowly and a shutter speed of 1/50 sec. produces a print in which the plane, small though it is on the negative, appears stopped. But is it?

No, it isn't at all. If you were to blow up this negative to produce the same size image as the one you made 25 feet from the jet, it would be just as blurred. You need the same shutter speed to stop a motion at 25 miles as you do at ten feet.

Now, here's how this error trips you up in actual shooting. You shoot a picture of a running child quite close. Your shutter speed of 1/100 sec. is not sufficient to stop action. So you say, "Aha, I will get far back, use the same shutter speed, then enlarge the picture area I want." The middle picture shows the far photograph you might make and the bottom represents your final enlargement. Surprise! It's no sharper than the first, close attempt.

The slower shutter speed for distant objects holds true only for *apparent* sharpness. When an image is smaller, it will appear sharper than the same image if enlarged. If you don't really care to have a close-up of the little girl and would settle for an average enlargement of the distant scene, you could get an apparently sharp picture.

So if you see that jet flying above, and want to take a detailed picture, don't try using a slow shutter speed and fine grain film. You'd better use a high shutter speed instead, and learn to pan evenly and smoothly. As a matter of fact, that might not be enough either. Putting your camera on a missile tracking machine costing thousands of dollars may be the only solution. Conclusion: action techniques can't be learned by chart or rote, think them out for yourself.—H. K.

Let's face it, unless you are a still life buff, every photograph you take has an element of action. From the wink of your best girl's eye to the frightening speed of a racing sports car, the world is a series of movements waiting for your camera. Action problems change as the photographer progresses in skill and knowledge and equipment. Think back to that first box camera. The question was not how *to stop* action with its limited shutter speeds, but how to get the family dog and Sister Sue *to stand* still! The professional action shot of earlier years was different, too.

The scene was usually large in scope. It was enough for the sports photographer to get Babe Ruth and that home run ball rising up out of the infield on one frame. To make a shot such as Earl Seubert's, *page 74*, a matter of routine? Impossible. To even think of shooting fast-moving objects at a shutter speed of 1/10 second? Ridiculous. Today, just as you have changed, so has the whole aspect of action photography. Why, photographs are now being taken for research with electronic devices at the astonishing speed of 10 micro-milli-seconds (translation: 10

billionths of a second)! In a sense techniques have far outdistanced the photographer's imagination—and thus, his needs. We no longer have to take pictures to prove that we can merely *stop* action. Rather we are concerned with *showing* it. There are four currently popular methods of doing this: 1. Stopping action. Example: Hy Peskin's color shot of champion diver Don Harper, *right*. While the shutter speed in this case was only 1/200 sec., it was sufficient to stop Harper since he was at peak of action. (Experienced photographers know that at peak action there is a fractional instant when all movement ceases. Learning to anticipate this is the first job of the action photographer.) 2. Panning. Example: Tony Karp's picture of girl on carousel, *right*. The speed of the merry-go-round was too fast for film. Karp moved his camera at the speed which

the child and horse were moving. The background was actually moving at a slower speed, but the camera movement makes it look as if it is moving at a faster speed than is the child. 3. Blurring. Example: Y. Ernest Satow's quickly-moving pigeon, *page 69*. A few years ago this technique was considered by some people not to be a technique at all, but a mistake. There are still those who feel that while blurring is valid, some portion of the picture must be sharp. This brings us to the final action method. 4. Combination of stop, blur and pan in one picture. Example: Tom

Burnside's remarkable racing scene, *page 73*. Naturally there are many variations within these four categories. And these methods deal with but one aspect of shooting. Lens choice, too, can exaggerate, enhance, make possible new views of action. A wide-angle may permit you to include a large area of activity. Example: Carroll Seghers II's panoramic picnic, *pages 65-67*. The apparent exaggeration and distortion of the wide-angle, when properly used, increases the graphic impact of action. Example: Al Franckeovich's carefully planned ping-pong player, *page 72*. A close-in view concerned with details the eye would miss is found in Seubert's telephoto picture, *page 74*. Certain darkroom procedures may also help. The simplest of these is cropping. Example: Satow's blurred bird would not have its present power if he had printed the full negative. You can also imitate blur and panning by moving the paper or shaking the enlarger as you are printing. The varieties of and in action photography are infinite; their impact is singular. No single aspect of picture taking will add so much vitality, impact and fun to your work as the everyday use of these action techniques. It is true that you may have to develop a strong backbone to contend with the "everything must be stopped" advocates. But what's photography without a good argument?

—JACQUELYN BALISH

PICTURE ACTION WITH YOUR CAMERA



Photo by Tony Karp. Praktina FX, 135mm Travenar. Super Anscochrome. Exposure: f/3.5, 1/25 sec.

Photo by Hy Peskin. Foton, f/2.5
100mm Cooke lens. Kodachrome.
Exposure: f/5.6, 1/200 sec. ▷

SHOOT 35MM COLOR 3 WAYS: PAN IT, BLUR IT, STOP IT!

Color adds another dimension to the multi-choice of action techniques. Case in point: the brilliant streaks of color in carousel shot, *above*, which came from panning the camera to follow action and get sharp image of little girl. Contrast two opposing techniques, by two of the world's best action sports photographers, demonstrated by the ghost image of the baseball player, *right*, and the sharply delineated dive of champion Don Harper, *far right*. Photographers Kauffman and Peskin both used rapid sequence cameras. However, similar photographs can be taken with almost any 35mm camera. Study particular action and learn to anticipate it. Then choose specific color effect you want and shoot for it. Electronic flash might have stopped baseball player as still as diver. Would that have been more effective? Diver was taken at peak moment, when action is stopped. Would you have liked picture more if slower shutter speed resulting in blur, had been chosen?



Photo by Mark Kauffman. Foton,
100mm Cooke lens. Kodachrome.
Exposure: f/16, 1/10 sec. ▽




Photo by Hy Peskin. Foton, f/2.5
100mm Cooke lens. Kodachrome.
Exposure: f/5.6, 1/200 sec. ▷

Photo by Mark Kauffman. Foton,
100mm Cooke lens. Kodachrome.
Exposure: f/16, 1/10 sec. ▽

Photo by Carroll Seghers II. Leica IIIIf, 28mm Serenar. Exposure: f/16, 1/200 sec.



LOTS OF ACTION? TRY WIDE-ANGLE LENS!

If anything photographic should be labeled spectacular, it is this wonderful photograph of teen-agers taken by Carroll Seghers II. His assignment: to make one picture symbolizing "The American Teens." Seghers hired a group of teen-age models, directed each situation separately, then rehearsed

nm Serenar. Exposure: f/16, 1/200 sec.



the entire company together. The nearest subject was about four feet from the camera. To include as many people as possible, Seghers chose a wide-angle lens. To catch the quick reactions of this alive group he used a rapid wind lever on his camera. Picture is huge blow-up from 35mm Plus-X negative, was cropped across the top by us to add width. Seghers wanted to show youth "in all its boundless energy." He succeeded.





ACTION
(cont.)

Photo by Earl Seubert. Nikon S2, 600mm Kilfitt. Exposure: f/5.6, 1/1000 sec.

Photo by Sonja Bullaty. Exakta, 58mm Biotar. Exposure: f/5.6, 1/500 sec.





Photo by Y. Ernest Satow. Leica M-3, 90mm Elmar. Exposure: f/4, 1/60 sec.

COMMON SUBJECT: 3 UNCOMMON PHOTOGRAPHS

"Cultivate your garden." "Shoot in your own backyard." How often has your travel-itchy soul rebelled against such pious advice? Alas, the advice is too true. For here is the commonest of subjects, as close as the nearest bag of crumbs. Yet imagination and skill have given us viewers three eye-catching images. Earl Seubert, of the *Minneapolis Tribune*, who uses long lenses with tremendous skill, showed the enduring patience of the true nature photographer in waiting for a duck to splash. The 1/1000 second shutter speed froze the water into icy diamonds. A more common lens was used by Sonja Bullaty for her photograph of a pigeon landing on an outstretched hand. She, too, used an extremely fast speed—1/500 second. She de-emphasized confusingly detailed background by throwing it out of focus. Y. Ernest Satow faced a maddening problem: to get the image of a bird, which existed only in his mind, onto a piece of film. He exposed many frames, tried varying speeds, finally settled on the comparatively slow time of 1/60 sec. as the bird flew horizontally past the lens. This final picture is about a 20X enlargement, severely cropped and printed on a hard paper to increase contrast and thus emphasize the broken grain pattern.

TRY SETUPS FOR SIMPLE ACTION AROUND HOME

If you've never been able to shoot "candid" pictures, such as these three, around your home, don't despair. Just set them up. For that's what all three of these photographers did. A small child, a young puppy, a roll of seamless white paper as a backdrop, a photoflood or so bounced off the ceiling and all you have to do is wait for the hilarious moment as did Burt Owen, *below*. Horseplay before bed time. A wonderful time to show happy mother and child. And if there isn't enough light in the bedroom, use a flashbulb or a small electronic flash unit as did Suzanne Szasz, *top right*. Mother can also be of help, even outside camera range. Morris Jaffe stood near window, had mother blow soap bubbles at child. Little girl laughingly tried to catch them. Good tip: Set up a situation in which a natural action can take place. Don't try to direct a child into a specific pose. And keep yourself relaxed for that "candid" setup.

Photo by Burt Owen. Rolleiflex. Bounce flood. Exposure: f/5.6, 1/100 sec.





Photo by Suzanne Szasz. Rolleiflex. 100-watt sec. electronic flash. Exposure: $f/5.6$.



Photo by Morris H. Jaffe. Rolleiflex. Exposure: $f/5.6$, $1/100$.

ACTION (cont.)



Photo by Al Francekevich. Nikon S2, 21mm Biotar. Exposure: $f/4.5$, $1/125$ sec.

Photo by Tom Burnside. Leica MP, 35mm Canon lens. Exposure: $f/22$, $1/10$ sec. ▷

WIDE-ANGLE DISTORTION GIVES IMPACT

Is a ping-pong ball half the size of the paddle? Is the front of a sports car twice as wide as the rear? And were you aware till now just how much distortion, because of the magnification of the foreground image, there was in these two photographs? Probably you weren't; yet it is this apparent distortion which enhances the feeling of speed in both the ball and the whizzing car. Francekevich's picture, *above*, was posed, in that the player deliberately tried to send his shot at the camera. Photographer was only a couple of feet to the left of the table. Converging lines in background form fan effect which also adds motion to elongated sphere of ball. Tom Burnside's panned shot of speeding racer is truly one in a thousand. Movement of car in one direction and action of racer's head in the opposite must have equalized each other, resulting in head's being the only stopped and sharp portion of otherwise blurred photograph. We do not recommend that other readers stand so close to wall of race track and whizzing cars as did Burnside, who estimates he was only about ten or twelve feet away as he panned camera to follow action. Wide-angle lens has long zone of sharp focus, which will make it easier for you to follow action and capture it without constantly having to refocus.

ACTION (cont.)



Photo by Earl Seubert. Nikon S2, 400mm Kilfitt. Exposure: f/8, 1/1000 sec.





DO YOU NEED A TELEPHOTO TO GET REALLY CLOSE?

There are times, of course, when nothing will do except a telephoto lens. Such problems face the professional sports photographer covering baseball every day. He can't very well throw himself into the infield to cover a close play at second base. He can, however, come in on the play by using an extremely long lens, set on a tripod, focused (in anticipation of the action) directly on the bag. Luckily, however, most of us are not faced with photographer Earl Seubert's job and his extremely vivid visual solution of it. More likely we are shooting Johnny skipping rope as was Raimondo Borea, *above*. Borea was no more than ten feet from his happy subject, was able to use a normal lens to get this happy, smile provoking picture. Photographic debaters often spend hours disputing this problem: Does the viewer get a less "intimate" feeling when the picture is taken with a telephoto lens? Look at these two pictures and decide for yourself. In the writer's opinion, the argument is stuff and nonsense. It is true that the telephoto effect has been to bring sign-board in background onto almost same plane as players. But picture is as intimate as this viewer would want to get with fast moving infield. What's your opinion?

ACTION (cont.)

FLAVOR CLOSE-UPS WITH ACTION

Probably the first kind of picture we want to learn to do skillfully is the portrait—and the most fun portrait is the happy moment—posed or not. Howard Zieff was at a picnic when he asked the two young women, *right*, to simulate the telling of a secret and its resultant look of surprise. The gag was enhanced further by severely cropping the final print, so that two eyes on two people tell the story. Camera-mugger extraordinary is Burt Owen's son, *below*, wearing grandfather's cap, much to his own and everyone else's enjoyment. Children will always turn a picture-taking problem into a game at the drop of an interesting prop. Secret whisperers of tender years, *far right*, were giggling at photographer Dave Heath who had been called back by them as he walked by, camera in hand. Little girls are sometimes very pleasantly camera conscious. However, Heath did not want to disrupt the game entirely, so he shot from far away, cropped later. Negative was originally horizontal in shape. Always try for animation in your portraits.

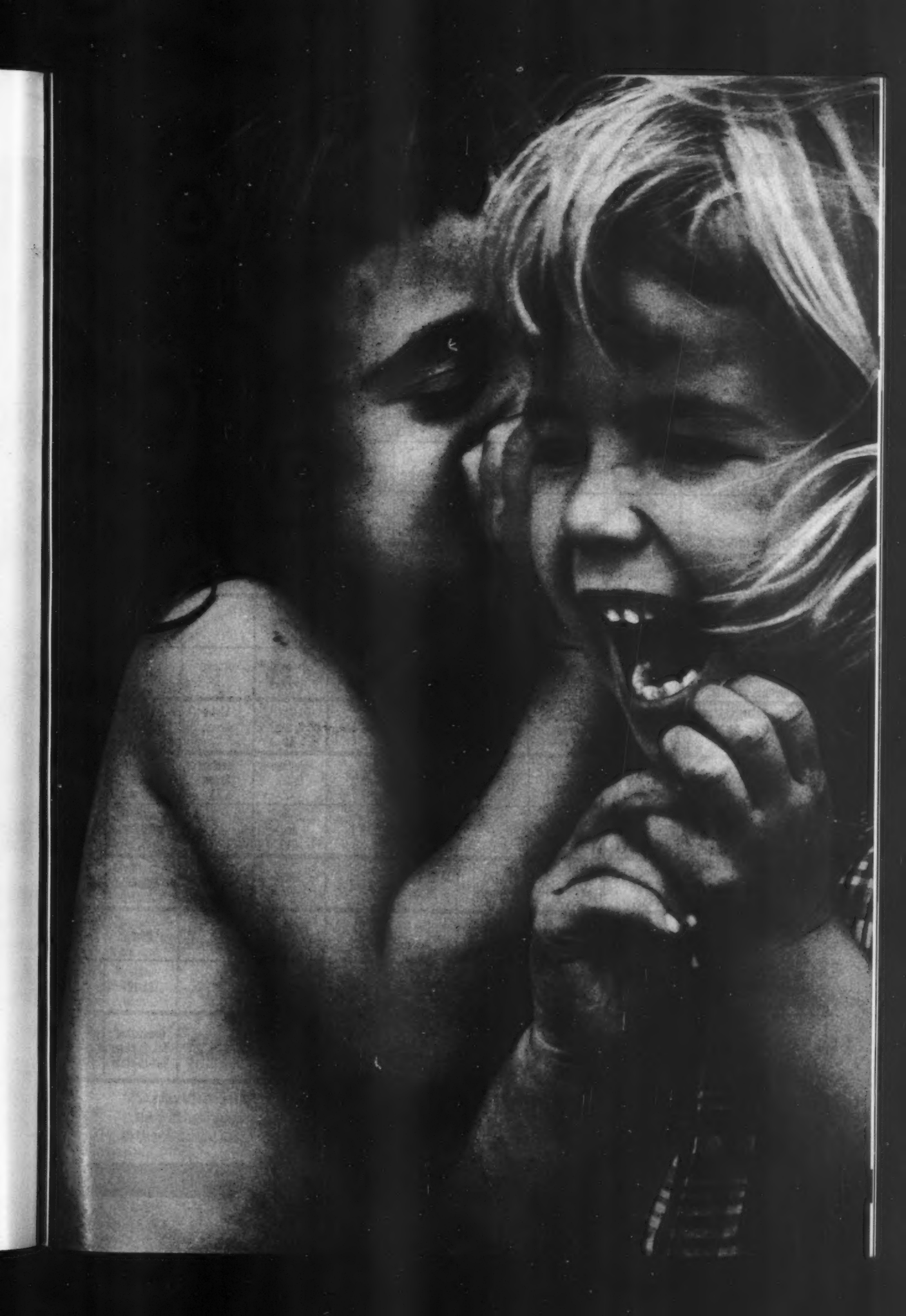
Photo, *right*, by Howard Zieff. Rolleiflex. Exposure: f/11, 1/200 sec.

Photo, *opposite page*, by Dave Heath. Nikon S2, 50mm Nikkor. Exposure: f/5.6, 1/125 sec.



Photo by Burt Owen. Contax, 50mm f/1.4 Nikkor. Exposure: f/8, 1/100 sec.





MODERN'S 1958 BLACK-&-WHITE FILTER GUIDE

WHEN TO USE A FILTER WITH BLACK-AND-WHITE FILMS—MOST

▽ For these effects: ▽	Use these filters*	Accura	Agfa	Burleigh Brooks	Ednalite	Enteco	Gallinger Bros. (GB)	Harrison & Harrison
1. For natural rendering of: clouds against blue sky, all average outdoor subjects, sand, snow, when sun is bright, sky blue.	Light Yellow (1.5)		Light Yellow	Light Yellow	Y-1	Light Yellow K1	Light Yellow K1	YL-1
	Medium Yellow (2)	Yellow K2	Medium Yellow	Medium Yellow	Y-2	Medium Yellow K2	Medium Yellow K2	YL-3
	Deep Yellow (2)				Y-3	Deep Yellow K3		YL-4
2. For greater contrast than medium yellow: distant haze reduction; sunsets.	Orange** (3)	Orange G		Orange	O-2	Orange G15	Orange G	YL-6
3. For lighter color, texture in green foliage: portraits against sky.	Light Green (4)	Light Green X1	Yellow Green	Light Green	G-1	Light Green X1	Light Green X1	GR-4
	Medium Green (5)			Green	G-2	Medium Green X2	Medium Green X2	GR-5
4. For dramatic white clouds in dark skies, greater contrast than medium yellow or orange: lighter color, more detail in red, orange.	Light Red (6)	Red A			R-1	Light Red A23		RD-4
	Medium Red (8)		Red Orange	Light Red	R-2	Red A25	Red A	RD-5
	Deep Red (25)				R-3	Infrared F		RD-8
5. For lighter color, texture in blues: to add haze in distant scenes.	Blue (8)			Light Blue	Tri-color Blue (47)	Blue C5		BL-10
6. To subdue reflections, give dark, dramatic sky.	Polarizing Filter (2.5)	Polarizing Filter		Polarizing Filter	Polarizing Filter	Polarizing Filter Polarizing Screen	Polarizing Filter	Graduated Yel.-to-clear Red-to-clear

*Number in parenthesis is the approximate filter factor for use with panchromatic film. Consult filter manufacturers for exact factors.

**Most "orange" filters sold in the U. S. are a very deep yellow. However, some, mostly of foreign make, are reddish yellow. These give somewhat darker skies than a deep yellow filter and render greens fairly dark.

WHY FILTERS? They have two distinct functions: to reproduce the tonal relationships perceived by the eye in the original scene, and to exaggerate contrasts for special effects. Film does not "see" in the same way that the eye does, tending to be oversensitive to blue. It also records "invisible" ultraviolet rays—which is the reason why the fleecy clouds we photographed sometimes disappear on the print. A medium yellow filter will put clouds back where they belong. The red filter is one which is useful for dramatic contrasts. It

darkens skies, water, makes ocean breakers appear stark and white. With infrared film, blue skies come out black, clouds and leaves (which reflect infrared strongly) white. The polarizing filter is a bit different breed from the others. It does darken skies, but also subdues unwanted reflections in mirrors, glass, puddles, or any reflecting surface. Filters require increased exposure, since they are holding back some of the light which would otherwise reach the film.

—NORMAN ROTHCHILD

USEFUL FILTERS (BETWEEN HEAVY RULES)—WHO MAKES THEM

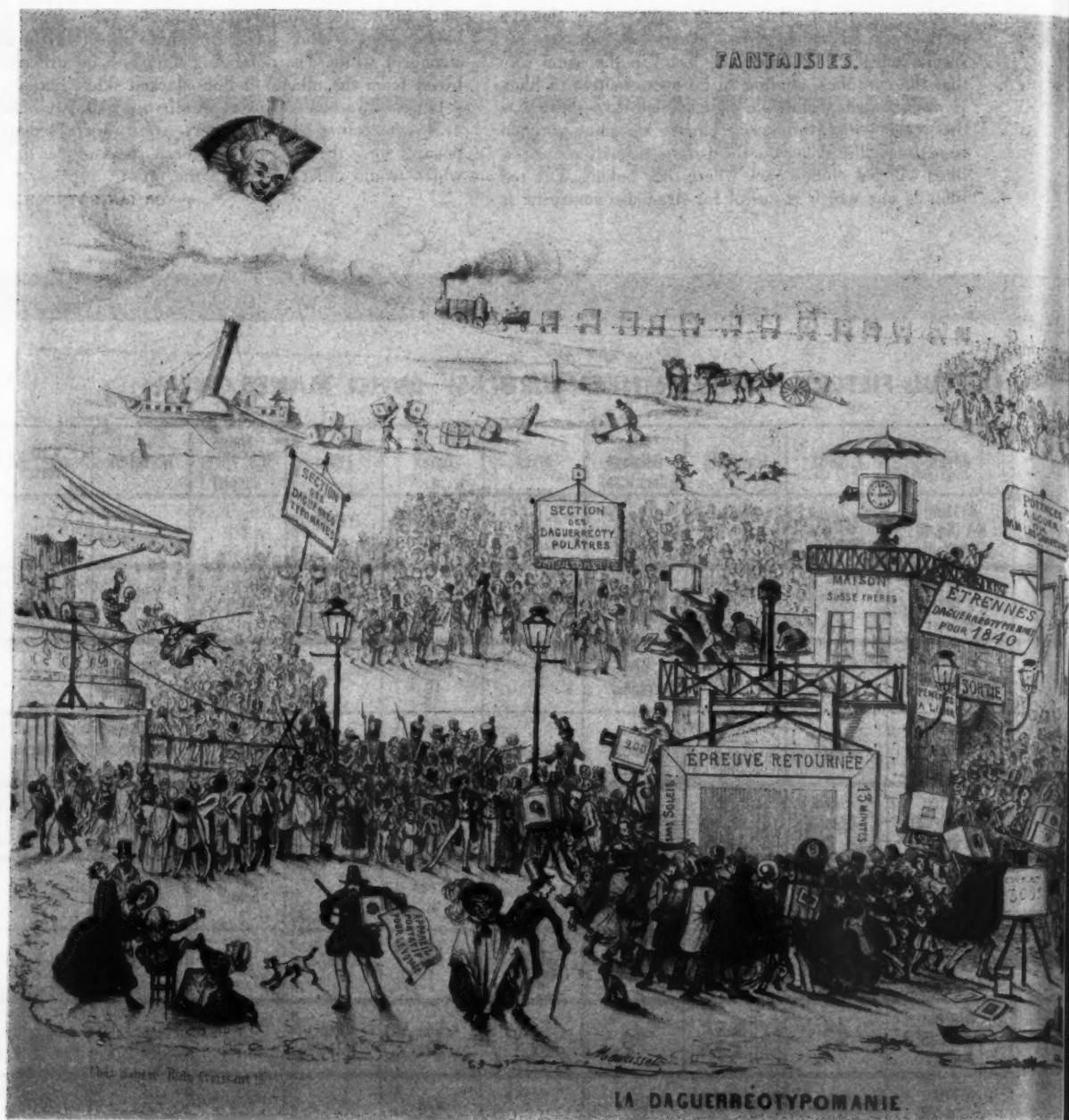
	Kodak	E. Leitz	Mansfield	Mico (Mimosa American)	Nikon	Optex	Tiffen	Walz (U.S. Photo Supply)	Wollensak	Carl Zeiss
	Wratten K-1 (No. 6) Light Yellow	Yellow #0		Light Yellow		Yellow I	Yellow I	Y 1		
	Wratten K-2 (No. 8) Yellow†	Yellow #1	Yellow 2	Medium Yellow	Medium Yellow	Yellow II	Yellow II	Y 3	Yellow 2 X	Yellow
	Wratten K-3 (No. 9) Deep Yellow	Yellow #2		Dark Yellow		Yellow III			Yellow 4 X	
	Wratten G (No. 15) Deep Yellow	Orange		Orange		Orange	Orange	O 2		Orange
	Wratten X1 (No. 11) Pale Green††	Green		Light Green	Light Green	Green I	Green I	G	Green	Yellow- Green
	Wratten X2 (No. 13) Medium Green		Green 2	Medium Green		Green II				
	Wratten E (No. 23A) Light Red				Red Orange	Red I				
	Wratten A (No. 25) Red†††	Red	Red 2	Red		Red II	Red I	R 2	Red	Red
	Wratten F (No. 29) Deep Red	Med. Infrared Dark Infrared		Dark Red		Red III				
	Wratten C5 (No. 47) Blue	Blue	Blue 4	Blue		Blue (Daylight)				
	Pola Screen	Graduated Yel.-to-clear Gr.-to-clear					Tiffen Polaroid ®			Bernotar Polarizing Filter

†Also a Pictorial Yellow

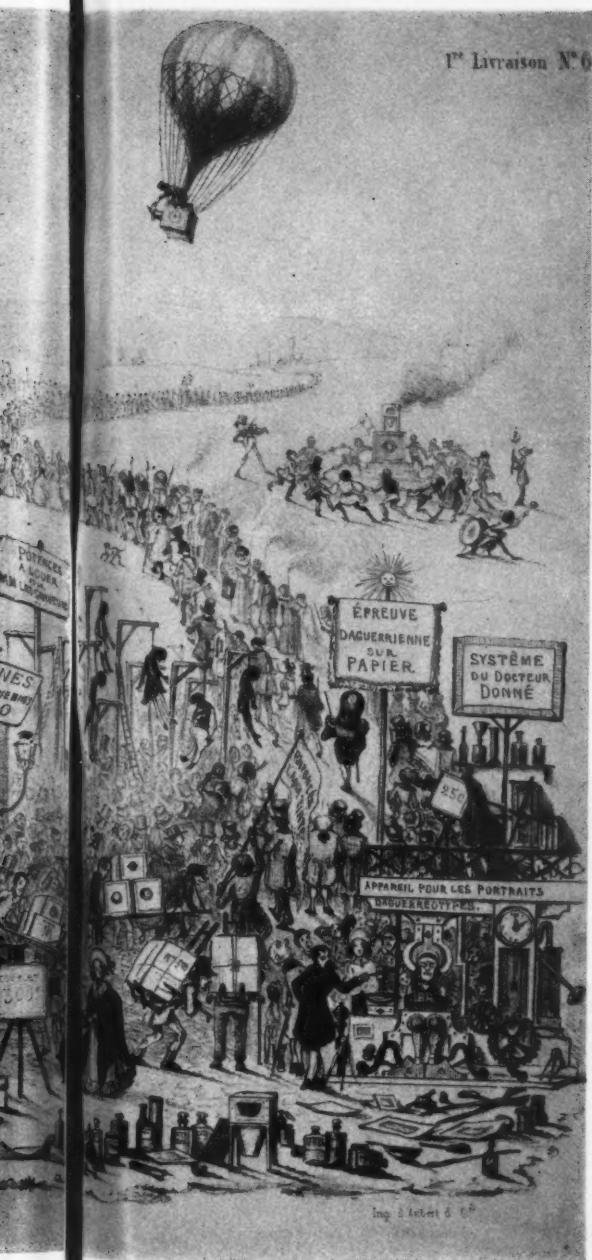
††Also a Pictorial Green

†††Also a Pictorial Red

FANTASIES.



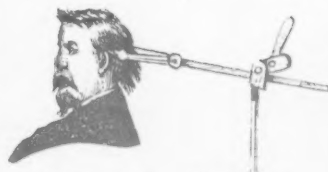
PHOTOGRAPHY 99 YEARS AGO



**190th birthday of Encyclopaedia
Britannica prompts research
into "photography"—as it
appeared to editors
of the 1859 edition.**

PHOTOGRAPHY, 1859: Not yet the reportage of a Mathew Brady, nor the motion studies of an Eadweard Muybridge, but the newest art, photography, already had its enthusiasts, its practitioners—and its satirists. The caricature (*left*) by the Frenchman, Theodore Maurisset, which first appeared in December, 1839, reflects the attitude of astonishment with which many regarded the fantastic phenomenon of the daguerreotypist and his large wooden box. It was with something more like horror that they viewed those instruments of exquisite torture designed to hold a subject's head immobile during extended exposures. Small wonder so many of these early portraits display a glassy eye and an anguished smile.

However, by 1859, photography had become "instantaneous"—exposures cut to a speedy one-half second—and people began to appear on photographic streets. The 8th edition of the Encyclopaedia Britannica, published in that year, took an optimistic view of the artistic and scientific future of photography, which it defined as "the art of delineating or painting by light, whether solar, sidereal, or artificial. . . ."



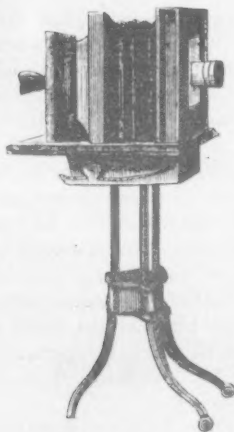
In connection with the 190th birthday of the Britannica, and the publication of its first detailed history, *The Great E. B.*, by Herman Kogan, researchers were prompted to dig back into early editions to find out just what they had to say about "photography."

The first edition (1768-1771) contented itself with a brief description of the camera obscura. But 88 years later, in 1859, photography had come of age and the 8th edition had a great deal to say about it.

"On the Applications of Photography"

. . . "The instantaneous process, as it is called, of taking pictures on collodion in half a second has enabled the artist to delineate 'a thoroughfare in London with its noonday crowd,' to seize the momentary attitudes and expressions of passion, and to fix on his tablet the gestures of the orator and the furious movements of the lunatic. . . ."

"To the sculptor, photography, whether simple or binocular, is of inestimable value. He can fill his portfolio with copies of all the treasures of the Vatican, the British Museum, and the repositories of art in Berlin, Munich, and other European cities . . . and when taken binocularly, they may be raised by the stereoscope into true relief, and studied, as if the originals were placed before him. . . ."



"To the pursuits of architect, the engineer, and the mechanist, photography is equally applicable; and in the diffusion of knowledge, and for the purposes of education, its power will be speedily recognized. Nor will it be less influential in humanizing the humbler classes of society. Portraits of their families in beautiful frame and morocco cases can be purchased for a shilling, and even for sixpence each. The emigrant may carry to his distant (*Continued on page 92*)



LAWRENCE N. SHUSTAK

IT'S A PLEASURE, these days, to find a young photographer with 20-20 vision—that is, one with an objective eye who lets us enjoy his imagery without trying to puzzle out a hidden “message.” This is not to say that Lawrence Shustak’s work is without meaning, but that what he has to say is thoughtfully interpreted in straightforward, rather journalistic style. He does not resort to trickery—finds no need to distort an image to suit a subjective concept of it. Rather he accepts his subjects as they are, preferring to wait for an instant in which they are uniquely themselves.

Shustak had an early interest in taking pictures. At the age of 12 he had already gathered together an impressive collection of aluminum pots and pans in which he did his own processing. However, he had no thought of becoming a photographer—not then. Out of school, he occupied himself with tool and die making, until chance and inclination recently took him to Europe. In Paris he renewed acquaintance with a photographer friend, who persuaded him to take up professionally what had been his prime interest all along. He spent two years experimenting with technique in London and Paris, then returned to New York to set up a studio of his own.

He shoots book and record album covers (*Continued on page 104*)

WHETHER it’s an interrupted ball game, a curbside conversation, or small hands exploring the sculptured calf of a museum amazon, Lawrence Shustak treats his subjects with warmth and understanding. He used Rollei-flex, Verichrome Pan for cityscape, *upper right*. Little girl, statue were caught with Leica M3, 85mm Summarex, Tri-X, f/1.5 and 1/100. Street scenes: Leica M3, 50mm Summicron, Plus-X film. Exact exposure data unknown, but settings were approx. f/11 and 1/100.



DISCOVERY *no. 37*





QUIET PLACEMENT of picture elements enhances peaceful quality of art gallery study by Ensign Thomas M. Atkins, Anacostia, D.C. Atkins used Gevaert film, Nikon S-2, shot at 1/60 and f/2.8. First Prize.

IMAGINATIVE CROPPING put kitten's ear at bottom of tall, dark column. Note repetition of triangle shapes. Hart Leavitt, Andover, Mass., used Panatomic-X, Kodak Reflex II, f/11 and 1/50. Second Prize. ▸

MONTHLY CONTEST



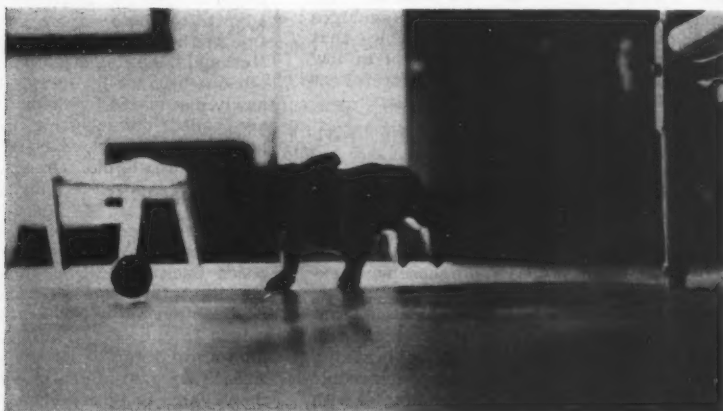
IMAGINATION in selecting picture detail can often make a photograph. Photo, *left*, takes a close look at bass fiddle, coffee cup, creates an image of jazz for the viewer. Kitten's ear, inquisitive eye, *right*, are enough to suggest playfulness of small subject.

Anyone may enter any number of black-and-white prints in MODERN's "Monthly Contest." Pictures must be 4 x 5 or larger, with the exception of Polaroid prints, which may be submitted in original size. Your name, address and all technical data must appear on the back of each print. No entry blanks are required. *Please enclose a stamped (first-class postage), self-addressed envelope* if you want us to return pictures we're unable to use. All entries are considered for use elsewhere in the magazine. Send them to Columns Editor, MODERN PHOTOGRAPHY, 33 W. 60 St., N. Y. 23, N. Y.

LOW ANGLE which eliminated all but story-telling detail was chosen by Forrest Harris of Pittsburgh, Pa., for "Quiet Jazz." Leica M3, 1/60, f/2.5. Third Prize.



WELL-TIMED playground shot by Herman H. Levart of Hartsdale, N.Y., shows unusually fine use of square format. Picture is uncropped: Levart composed it on the ground glass of his Rolleicord III. Tri-X film, $f/11$ and $1/250$ second. Third Prize.



PRE-FOCUSED Rolleiflex caught "Fred" racing after ball. Tri-X, $f/3.5$, $1/100$. Harry Redl, San Francisco. Third Prize.

**MODERN PHOTOGRAPHY'S
MONTHLY CONTEST
FIRST PRIZE \$25
SECOND PRIZE \$15
THIRD PRIZES \$10**

What's Ahead?

by LLOYD E. VARDEN

A new photographic system based on light-sensitive dyes and pressure "development."



You have no doubt seen the rather recently introduced NCR typewriter copy system developed by the National Cash Register Co. in Dayton, Ohio, but probably did not consider its possible application in photogra-

phy. NCR stands for "No Carbon Required" because the method by which hand or typewritten copies are produced bears no resemblance to the time-honored carbon paper method. As a matter of fact, the NCR business forms, etc., are so unique—smudges and dirty fingers are impossible—that one is baffled in trying to explain how the sheets work even after careful examination and experimentation.

Basic principles of system

The main principle on which the NCR process is based has been described as a "technique by which liquids are packaged so that they behave like powders." This description is vague, but it does make sense when explained.

The National Cash Register Company, after a 12-year research program, found a means for breaking liquids up into droplets of microscopic size and then coating each droplet with a thin layer of gelatin or synthetic resin. The coated droplets, or capsules, are about a millionth of an inch in diameter. (This is much smaller than the size of the average silver halide crystal in a fine-grain film emulsion.) In physical structure they are similar to a vitamin capsule, except in a size more suitable for microbes than for humans.

These tiny capsules, *en masse*, form an extremely fine powder that is perfectly dry to the touch, although actually there is 70 percent liquid present. By encapsulating the liquid it is protected from the air, allowing indefinite storage of even easily oxidizable substances.

Now it is evident that the liquid within each capsule can be released by crushing the protective layer. The pressure exerted by a pencil in normal

handwriting or by a typewriter key is sufficient. This is the basis of the carbonless copy materials. The NCR paper has a light clay coating on its front surface and a coating of "liquid powder" on the back. When several of these sheets are placed in a stack and local pressure is applied to the clay coating of the top sheet, the capsules on the underside of each sheet break, releasing their liquid, which is then absorbed by the upper clay coating of each subsequent sheet. If the capsules contain a dye or other colored substance, the copy would be formed directly. On the other hand, the capsules can contain a colorless chemical that is capable of reacting with a second chemical contained in the clay coating to form a colored compound.

Possible photographic applications

There are several means that immediately come to mind by which the liquid encapsulating technique can be adapted to photographic reproduction. One method, though, developed by the National Cash Register Co., is far from obvious because it depends upon dyes newly discovered by them. These dyes are called metachromatic dyes. They have the property of being colorless under yellow light, turning a brilliant blue when exposed to blue light. When dissolved in an oil these dyes can change from colorless to colored and vice versa again and again when exposed back and forth to yellow and blue light. But their sensitivity to light is exhibited only when they are dissolved in the oil. Thus, a permanent photographic reproduction is made possible by first forming a blue image and then evaporating the oil. A black-and-white positive is exposed onto a sheet coated with dye-containing capsules (dyes in oil solution, of course), using blue light. In darkness the sheet is then passed through pressure rollers in contact with a transfer sheet. All of the capsules will be crushed and the blue dye image transfers to the second sheet. As soon as the oil is evaporated the image can be viewed in white light since the dye is no longer light sensitive.

Another possible photographic system, and one which I have not seen mentioned in any of the reports from the National Cash Register Co., would operate in the following manner:

1.) Instead of using plain gelatin for the tiny liquid-containing capsules, a photographic emulsion would be substituted.

2.) For monochrome reproduction

the capsules would contain a single color, e.g., a black dye solution. For color reproduction a mixture of capsules containing yellow, magenta and cyan dyes—one dye only in each capsule—would be coated on the sheet.

3.) Upon exposure, a latent image would form on the emulsion layer of those capsules struck by light. In a monochrome process a blue-sensitive emulsion would be adequate, but in a three-color process the capsules containing yellow, magenta or cyan dye would have to be blue, green and red sensitive, respectively. Color separations would be needed, too.

4.) Development of the image would be carried out in a tanning developer so as to harden the gelatin surrounding the exposed capsules.

5.) Pressure-roller processing after chemical development would crush the unexposed and thus unhardened capsules. The dye, or dyes, would transfer to a receiving sheet in an amount inversely proportional to the exposure in any given area.

Such a process would be a positive-to-positive type because in the high-light areas a maximum number of capsules would be exposed and developed, corresponding to a minimum amount of dye transfer during pressure application. Therefore, for a color process, black-and-white separation positives would be necessary, or three exposures through a positive color transparency could be made using blue, green and red filters in sequence.—THE END

New Booklets

OUTDOOR ADVENTURES IN COLOR SLIDES, Eastman Kodak Co., Rochester. 64 pages, illustrated. 50 cents

In this booklet full of color plates the Kodak Co. gives the amateur ideas on the use of color film. He is advised to watch the light, try fill-in flash, use reflectors, snap different atmospheric influences, learn about filters, shoot night pictures, stop action, take close-ups, photograph underwater or in the air and make some sequence shots.

Also included are tips and ideas on how he might go about these various picture taking activities, with examples and charts.

G-E PHOTOLAMP AND LIGHTING DATA, General Electric, Cleveland. 44 pages. 10 cents

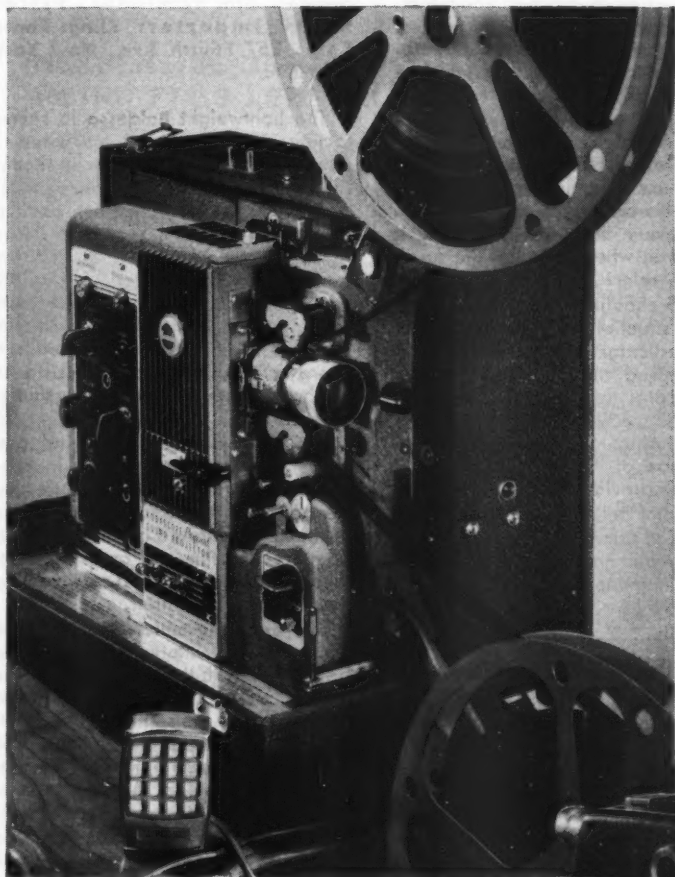
Here's a handy little reference booklet containing all sorts of specifications and data on G-E flashbulbs. It has descriptions of each type of bulb, tips for shooting with flash in various situations, charts with up-to-date guide numbers for the new, fast films and other important lighting information.

make your own sound movies

Here is superb 16mm equipment. With the Cine-Kodak K-100 Turret Camera you have the precision, the lenses, and the controls to bring out your greatest movie-shooting ability.

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◀ THE KODASCOPE PAGEANT SOUND PROJECTOR, MAGNETIC-OPTICAL, MODEL MK4

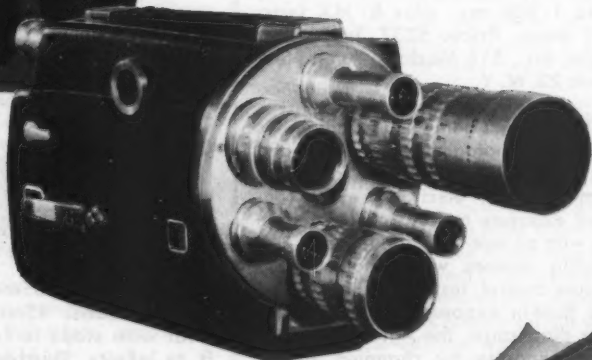
- Records and plays back magnetic sound. A magnetic stripe can be added to any 16mm film—old or new. (Kodak Sonotrack Coating is 2½ cents a foot, list.)
- Has individual volume controls for phono and microphone inputs, making it easy to mix voice and music.
- Locking device prevents accidental erasure.
- Plays standard optical sound tracks, too.
- Comes with powerful 10-watt amplifier.

In addition, the MK4 has all the regular Pageant features: 2-inch f/1.6 Ektanon (Lumenized) Projection Lens, 750-watt lamp, 2000-foot film capacity, convenient folding reel arms with belts attached for easy setups, 8-inch speaker in baffled enclosure, lifetime lubrication, single-case construction. List price, \$850 with microphone.

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Cine-Kodak K-100 Turret with 25mm f/1.9 Ektar Lens is \$337.
Other lenses extra. Single-lens K-100 from \$299.



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MODERN

MODERN PHOTOGRAPHY'S exclusive monthly equipment report section devoted to informative, unbiased field tests of equipment submitted to the editors for review.

AGFA CAMERA WITH AUTOMATIC EXPOSURE



Specifications: 2 1/4 rangefinder camera (120 film) with fully automatic exposure control. **Lens:** 75mm f/3.5 four-element Agfa Color Solinar in helical mount with stops to f/22. **Shutter:** Prontor SVA, 1 to 1/300 sec., plus B; MX sync; self timer. **Price:** \$237. **Importer:** Agfa, Inc., 515 Madison Ave., New York 22, N. Y.

If you don't believe automation has come to photography, just go and pick up the nearest 35mm or movie camera—LVS, electronic eyes, coupled exposure meters. Well, here we go with an eye-level rangefinder 2 1/4 folding camera with automatic exposure control. Instead of hooking up the built-in exposure meter with the lens diaphragm, the Agfa technicians vary exposure by changing shutter speed.

The Agfa Automatic 66 has two shutters in one—the Prontor SVA shutter incorporates a pneumatic shutter mechanism plus the standard

type. When placed on automatic, the pneumatic shutter goes into operation. Preset the film speed dial, choose an appropriate aperture setting, and just point the camera. Light hits the photoelectric cell, which is built into the camera, and is converted to usable energy. The shutter speed is automatically changed in relation to the amount of light present. (This pneumatic shutter has speeds ranging from 1/15 to 1/250.) It works—you get correct exposure every time. Well, almost. It depends on whether or not the aperture you select suits the light level.

Before shooting you must test the lighting situation. Check the shutter speed indicator dial. If the pointer goes beyond the speeds available, this indicates that the selected aperture is incorrect. You must then adjust the aperture to compensate for either the excess of light or the lack of enough to provide a correct exposure.

The Color Solinar lens proved to be sharp at all apertures. Oddly enough, the Automatic 66 must have its shutter cocked manually before each exposure.—E.M.

BUILT FOR SPEED: THE NEW BALDESSA Ib



Specifications: 35mm rangefinder camera. **Lens:** 45mm f/2.8 Baldanar with stops to f/16; focuses 3 ft. to infinity. **Shutter:** Prontor SVS, 1 to 1/300 sec. plus B; MX sync; self timer. **Viewing:** Combined range-viewfinder; luminous frame with automatic parallax correction. **Other features:** LVS; built-in ex-

posure meter; rapid film advance; pop-up rewind handle; frame counter; film reminder. **Price:** \$79.95. **Importer:** Kling Photo Corp., 257 Fourth Ave., New York 10, N. Y.

The lightweight Baldessa Ib seems to have been designed for speed—although the focusing device, shutter release and rapid advance lever aren't where you'd expect to find them on most 35mm cameras. You focus with a knurled wheel on the front of the camera just under the exposure meter photocell. The right forefinger falls naturally onto the shutter release directly underneath it. However, it offers enough resistance so that we never tripped the shutter accidentally.

The combination rapid wind and shutter cocking mechanism is controlled by a Quick Transport Key on the bottom of the camera. A half turn of the key (operated by the left hand) advances the film and cocks the shutter. It is not necessary to remove your eye from the viewfinder.

The exposure meter is of the type which requires simply that a red arrow be lined up with the meter needle. The correct LVS number appears in a window on top of the setting wheel. Shutter speed and aperture scales are on top of the lens barrel, making it a simple matter to select the proper combination for any shooting situation.

The meter worked fine outdoors and in bright light. However, the photocell isn't sensitive enough to register low light levels. Likewise, we found the rangefinder impractical in dim light.

We got good results at all apertures (we used a separate meter indoors in low light), but did fuzz out on occasion at maximum aperture in dim light due to our inability to distinguish when the rangefinder images were properly aligned.

The Baldessa Ib is compact and seems to be well built. A nice feature is the film transport check—when the center of the rewind handle rotates, it indicates that the film is transporting correctly.

There is a sister to the Ib—the Bal-

TESTS

the newest cameras
the latest films
important accessories

nessa Ia—identical except that it does not have a built-in exposure meter. Its price is \$59.95.—M.T.

INEXPENSIVE 35MM PETRI, F/1.9 LENS



Specifications: 35mm Petri range-finder camera. **Lens:** 45mm f/1.9 Orikkor, a six-element lens with stops to f/16. Focuses from 2.8 feet. **Shutter:** Copal MXV, 1 to 1/500 sec., plus B; MX sync; self timer. **Price:** \$69.95. **Importer:** Petri Camera Co., Inc., 11 W. 20 St., New York, N. Y.

If you want a 35mm camera with an f/1.9 lens but think you can't afford it, here's one with a budget price tag.

Fast lenses have been a problem to lens designers for many years. Not that it's so difficult to make a fast lens—the problem is to make them so that they will take sharp pictures. Once such a lens is perfected, then manufacturers start looking for a way to cut the cost.

The first thing we did with the Japanese-made Petri f/1.9 was to test the lens at its widest opening. We wanted to see if an inexpensive f/1.9 lens could also take sharp pictures. Here's what we found: At its widest aperture the Orikkor f/1.9 was acceptably sharp. There was little fall-off of sharpness at the edges of the frame. Sharpness did increase as the lens was stopped down, as was to be expected. To sum up the performance of this inexpensive 1.9 lens—we don't know how they do it—but they do.

The fast lens isn't the only important feature of this camera. In

addition to the Copal MXV shutter, it has an etched frame range-viewfinder, self-setting film counter (just load the film and close the camera back—the counter is automatically set), single-stroke rapid wind lever and a rapid rewind handle.

The camera appears to be well made—and during our tests never failed to operate easily and efficiently. Add up the features of the Petri 1.9—think about the price—we think it's quite a camera.—E.M.

BETTER RANGEFINDER-VIEWFINDER ON RETINA



Specifications: Kodak Retina IIIC 35mm folding rangefinder camera with interchangeable front lens components. **Lens:** 6-element 50mm f/2 Schneider Xenon. 80mm f/4 and 35mm f/5.6 or f/4 front lens components available. **Shutter:** Synchro-Compur with 10 speeds from 1 to 1/500 sec. LVS coupled, self timer, full sync. **Focusing:** Etched frame viewfinders for 35, 50 and 80mm picture areas with full parallax correction from 2½ ft. to infinity. **Other features:** LVS coupled built-in exposure meter, single-stroke rapid wind lever, provision for double exposure, many accessories including microscope adapters, close-up lenses. **Price:** \$175.

You must have fairly sharp eyes to distinguish a new camera model from the old one these days. The Retina IIIC, for instance, is almost the spit-

ting image of the previous model, the Retina IIIC. Confused about them already? Thought so. The secret is in the "C," capital or lower case "c." Retina IIIC is the old model, Retina IIIC is the new.

As for the camera, one look through the viewfinder will separate the old from the new. The old Retina IIIC had one of the poorest rangefinder-viewfinders going. It was tiny and hard to use. For years, Retina enthusiasts who skied or mountain climbed or performed other feats of derring-do where a tiny folding compact camera was essential, put up with this so-called rangefinder because there just wasn't anything around quite as small and quite as compact.

The new rangefinder-viewfinder is an answer to a prayer (mine). Not only is the entire window larger, the images more brilliant, the secondary rangefinder image clearer with more contrast, but the entire picture area is outlined by a clear white parallax compensating frame. In addition, the new Retina focuses down to less than 2½ feet. What more could you ask for with full parallax correction?

Well, you could ask, for instance, for a projected frame rather than an etched picture frame which is hard to view while your eyes focus on the image itself. You could also request them to remove the new etched frames for the 35mm and 80mm lens components within the viewfinder which confuse you and are a bother if you don't happen to own these components.

While on the subject of components, let's say that the Retina IIIC is a great camera, if you don't need interchangeable lens components. If you do, well, it's a long hard road. You must exchange the front elements of the 50mm Schneider Xenon lens for a 35mm f/4 or 90mm f/4 component. These components are mighty impressive as far as size is concerned but you can't shut the camera with the components in place and they don't couple to the rangefinder.

Now back to the camera itself. Aside from the really excellent view-

(Continued on page 105)

Technical Assistance By Morris H. Jaffe

How to Shoot a . . .

MOVIE OF YOUR PETS

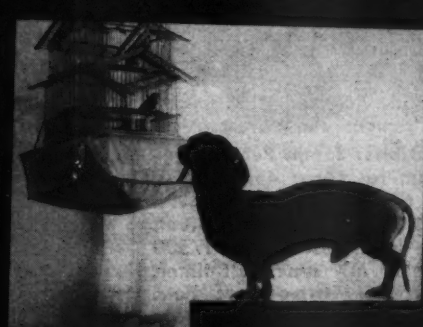
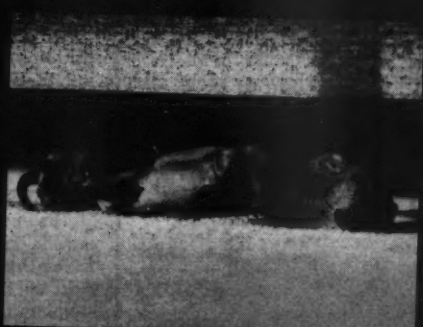
AT LEAST half the fun in making a pet movie is the unpredictableness of much of the footage. Plan a shot down to the last detail—and your dog is likely to do just as he pleases. Pets seem inclined toward making their own scripts—brooking little interference from humans. In fact, they just may not be interested at all in keeping to a time schedule, or even staying on the set. But don't let that stop you. If you take time out to study your pet before shooting you'll find plenty of material for a film that won't promote a clash of wills.

The kind of movie you shoot depends to some extent on your pet—dog, cat, fish, birds, or some unusual creature loved only by your particular household. You won't be able to make a story film, for example, of a tank of tropical fish—unless you can spend months watching and waiting for important scenes. But you can construct a film filled with unusual colors, and flashing, graceful movement.

A dog or cat, however, can provide plenty of material for the story-type film—occasionally too much. We decided to use Chico—a recalcitrant, domineering, and unpredictable dachshund for this month's family movie. While he cooperated only when the mood struck him, we found it fairly simple to devise ways of enticing him into reenacting his daily adventures and misadventures.

It is important to keep shooting plans flexible and to use easy to handle equipment. You won't miss good shots if you keep your camera loaded and ready to shoot. Use tungsten-type color film for shooting indoors with photofloods. Outdoors you need only to slip a conversion filter over the lens to balance the light for the film. While a tripod helps to get steadier images, a pistol grip provides more mobility. A pair of individual flood lamps with built-in reflectors, or in metal reflectors, and a barlight will take *(Continued on page 94)*

FAMILY MOVIE CAMERA No. 8

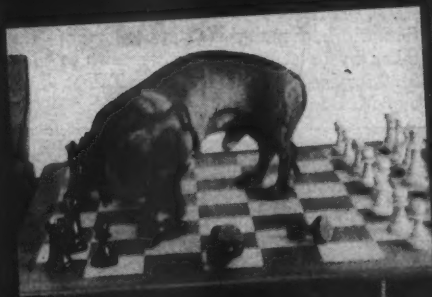


The only practical way to shoot scenes such as dog sleeping is to wait until your pet provides the opportunity. Barlight is most practical lighting arrangement for impromptu filming. But don't begin and end the scene with dog sleeping. Instead, wake him and continue to shoot as he looks around.

Dogs and cats are fascinated by other animals. Here, the dog's curiosity about the birds made it easy to position him for the scene and also provided interesting footage.

A semi-silhouette of the birds heightens visual impact of the scene. Exposing for the backlight from window will darken cage bars and birds. If you expose for detail in cage, hold palm of your hand in front of cage and take meter reading from it.

Thinking ahead to the next scene often provides transition shot such as this one, shot through bars of the bird cage. You can use tele lens to shorten apparent distance between birds and dog without actually moving dog too close to cage.



Shot through tank matches one through cage in feeling, but provides transition to next scene. Another way would be to open scene with shot of top of tank and then pan slowly down to show dog watching fish. You'll need more light than provided by tank fixtures. Place a flood lamp high over the tank so light also hits dog. For added variety add close-up of fish, using close-up attachments to make the shot.

If you leave your pet to his own devices for a time you may find that he provides interesting scenes just by being himself. You'll have to keep equipment simple and mobile to make the most of chance shots.

Shoot action sequences more than once, using your best footage to make up the sequence. Shoot from several angles and, with small pets, get right down to their eye level.

The last scene in your pet film can show the dog re-entering the house, and then going back to sleep. If you film enough footage of his sleeping for the beginning of the movie, you can use some of it at the end as well.

99 YEARS AGO

(Continued from page 81)

home the portraits of those from whom he has been obliged to part. . . .

"The calico-printer may multiply his patterns photographically; and the carpet manufacturer and general decorator may fix in paper all the beautiful patterns . . . given by the kaleidoscope.

"In the science of astronomy, zoology, geology, metrology, ethnology, electricity, and magnetism, photography has been advantageously employed. The spots of the sun, the surface of the moon, the forms of the planets, and even groups of stars, have been delineated by their own light. . . . The ethnologist has begun to collect accurate pictures of the different races of man. The zoologist has obtained forms of animal life which the painter had attempted in vain to procure. The geologist has obtained delineations of phenomena which defied the highest efforts of his pencil; and the botanist has transferred to imperishable tablets those beautiful and complex forms of vegetable life which we seek in vain in . . . botanical collections.

"The last, and certainly the least application of photography, is one which was introduced last year at Nice. The Duke of Parma had his portrait at full length placed upon his visiting-cards. Some English gentlemen imitated his ex-

ample; and it has been partially followed in London and Paris. In order to diminish the expense, M. Besson of Paris takes 24 negatives at once on the same sheet of paper with a 24-lens camera; and he is thus able to print 24 cards at the same time, and greatly reduce the expense of their production."

The venerable Britannica woefully underrated this introduction of the *carte-visite*. In the years which followed, the small $2\frac{1}{4} \times 3\frac{1}{2}$ -in. portraits were produced by the millions. Though few people were so gauche as to actually leave them as calling cards, it became the fad to exchange them with friends and to collect them in albums. Many famous personages posed willingly enough, and portraits of everyone from statesmen and the royal families to writers and actors to Victorian "pin-up" girls were available to the "carte"-collecting public. Although the fad reached its peak in the 1860's, it was World War I before it disappeared.

On the history of photography

In straightforward fashion, the 1859 edition of E. B. pursues the origins of "modern photography":

. . . "This art is one of modern invention, which, though some steps to it were taken by preceding writers, we owe to M. Nicéphorus Niepce, Mr. Fox Talbot, and M. Daguerre. . . .

" . . . So early as 1814, M. Nicéphorus Niepce had attempted to fix the pictures produced in the camera obscura, and to copy engravings by means of light transmitted through them upon substances made sensible to its action. The substance used by M. Niepce was a tablet of copper coated with highly-polished plate silver; and he gave to his process the name of *heliography*. . . . In the year 1824 M. Daguerre had made experiments with the view of fixing the pictures in the camera, but he seems at that time to have obtained no definite results. . . .

"Having heard of each other's labours, MM. Niepce and Daguerre entered into a copartnership in December 1829. . . . The processes of the two artists were essentially different. . . .

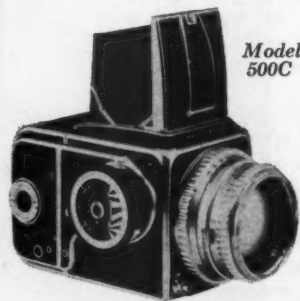
" . . . M. Daguerre introduced considerable improvements [into the process of M. Niepce] and in the course of his investigations he discovered an entirely new photographic process, in the success of which M. Niepce did not live to share. He died in July 1833; and soon afterwards a copartnership was formed between his son, M. Isidore Niepce, and M. Daguerre, in which it was admitted that the process discovered by the latter was essentially a new one, and should be called the *daguerreotype*, after its inventor.

"In order to reward the eminent in-



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Model
500C

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ventors of heliography, M. Arago, who had been previously entrusted with the secret of the daguerreotype process, induced the French government to give Daguerre an annual pension of 6000 francs . . . , and to Niepce a pension of 4000. . . . In proposing this measure to the Chamber of Deputies, M. Arago stated that 'France had adopted the discovery, and that from the first moment she had cherished a pride in liberally bestowing it A GIFT TO THE WHOLE WORLD.' Notwithstanding this declaration, M. Daguerre risked his public character in selling his invention to Mr. Miles Berry, to whom the officers of the crown in England granted a patent in the face of a remonstrance by a few individuals who had the manliness to oppose it. England was thus restrained for eight years from the use of this important process; but the specification was afterwards found defective, and the patent invalidated. It is a curious fact, that Mr. Talbot's patent for the sister art of the *talbotype* was also invalidated by an English jury; and it will never be forgotten in the history of art, that the rights of property over the two noblest inventions of the age, which the patent laws were enacted to secure, were wrested from their owners by the unjust decisions of an English jury, prompted by the selfish interests of individuals. . . .

"While these two ingenious French-

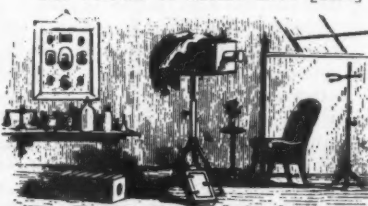
men were occupied with heliography, Mr. Henry Fox Talbot was . . . occupied with the same subject. On the 30th January 1839, six months before M. Daguerre gave his process to the world, Mr. Talbot communicated his discovery to the Royal Society; and in the following February he published his process of *photogenic drawing*, to which he afterwards gave the name *calotype*, which his friends changed to *talbotype*, in imitation of the example set by those of Daguerre. . . ."

On photographs in color

By the middle of the nineteenth century, color photography was still very much a thing of the future—but experimentalists were already at work:

"Although M. Biot in 1840 regarded it as an illusion to attempt to obtain the colours of nature photographically, yet in the same year Sir John Herschel actually procured . . . a coloured image of the solar spectrum. . . ."

"The colours of nature have [also]



been produced accidentally by several photographers. In taking a stereoscopic picture on collodion of ruins covered with ivy, a gentleman in Durham, who signs himself 'Magnet', was surprised to find the ivy green, the trunks of old trees brown, the stones gray, and the 'whole with the colours varied in high degree.' The colours were not altered in fixing the picture, but in drying it they lost their luster, with the exception of the green. . . ."

"Some of the colorific effects observed by photographers are the colours of thin plates, and have no connection whatever with the colours of nature. The action of light upon the collodion film changes either its thickness directly, or indirectly by changing its solubility; so that the light and dark parts of the picture exhibit different tints of Newton's scale of colours. . . ."

That was photography 99 years ago—primitive and embryonic compared to 1958 standards. However, who knows what tantalizing discoveries we might make if we could take a preview peak at "Photography" in the Encyclopaedia Britannica—2057 edition.—THE END

Herman Kogan's *The Great E. B., The Story of the Encyclopaedia Britannica*, published by The University of Chicago Press, is currently available from book dealers for \$4.95.

the HASSELBLAD SUPERWIDE

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Photographed at Batelle Memorial Institute by Herbert Loebel with the Hasselblad Superwide.

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FAMILY CAMERA

(Continued from page 90)

care of most lighting situations you'll probably encounter.

The first shot on page 90 came after an unsuccessful attempt to persuade Chico to go to sleep. As soon as we gave up, he dozed off under the couch and the camera and barlight went into action. Next, the script called for a transition to the bird cage, so we woke the dog, and continued to shoot while he looked quizzically about him.

Since the birds fascinated him, there was no trouble in fixing his attention on the cage.

A window provided enough light for an exposure of f/1.9 at 16 fps. A smaller lens opening could have been used by shooting at 8 fps, as long as both dog and bird showed little movement. An 8 fps rate tends to speed up normal movement and make it appear unnatural.

The scene with Chico watching a tropical fish tank led to an idea for a transition shot. First, we filmed Chico through the bars of the bird cage, using a telephoto lens to shorten apparent distance between him and the cage. Then, with Chico staring at the fish, we shot from the other side of the tank—right through the water. One photoflood placed high above the tank illuminated the water and the dog. Keep this kind of shot brief, because tropical fish are

very sensitive to temperature changes.

Having the camera ready often means getting unplanned, but unusual scenes, as on page 91. We surprised the dog climbing over the chess table, knocking pieces in every direction. Again the shot called for a barlight, because any other lighting setup would consume too much time to arrange—or at least time enough for the dog to escape.

Most dogs love to get outdoors, so after shooting the chess sequence, we opened the door and filmed Chico bounding out just ahead of retribution.

Chico likes to play ball, which allowed us to exercise a great deal of control over the next scene. The ball was thrown toward a pre-selected spot and a long shot was made as he raced after it. Then the camera moved in for a close-up and the shot was repeated. This time only the last part of the shot, showing Chico leaping up at the ball, was filmed. Matching the two shots by selecting a frame near the end of the long shot and one of the close-up frames where action was similar created a smooth cut.

Don't attempt to shoot your pet movie all in one day. Actually, shooting the movie over a longer period of time helps to develop ideas you might miss with a hurried shooting schedule. More important, a little shooting each time is much easier on the dog's patience—and yours.—M. A. M.

SHUTTERS

(Continued from page 55)

For information on reading the test results, turn to page 110.

Testing the focal-plane shutter

You can't test a focal-plane shutter for accuracy of speeds any more than you can the leaf shutter. However, you can check it to make sure your speeds are uniform, which is quite important.

Photograph a blank gray wall or cardboard, using an exposure meter to get the proper exposure. Develop normally. The negative area will appear to be an over-all gray. Use this negative as in Diagram 10 to determine exposure uniformity. Adjust the flood-lamp illumination so that the exposure meter needle rests at least half way up the scale with the negative in front of the small hole in the cardboard. Now, carefully move the negative in front of the hole so that the exposure meter has a chance to examine every part of the negative. If your shutter action is uniform, the meter needle should not move far from its set position at any time. If your exposure meter needle does move, check its reading against the set position, using the calculator dial as if you were actually

figuring an exposure. If there is more than ½ stop difference between the two readings (f/8 to f/6.3 for instance) the non-uniformity is serious and your camera belongs in a repair shop. If the uniformity is less than ½ stop, forget about it.

Conclusion

By the time you reach this point, it's probably obvious that shutters are not the simple things they seem to be when you press the release and the blades or curtains open and shut. Time lag, curtain speed-up are real causes for worry among manufacturers. But the more you know about the basic mechanical problems within the design of your camera's shutter, and how to test for them, the more uniformly exposed pictures you will get.—THE END

CORRECTIONS, SUMMER TYPE

Yashica, Inc., 234 Fifth Ave., New York 1, N. Y., was omitted in the July '58 "Modern Tests" as the importer of the Yashica 8T. And in the August issue, somehow U. S. Photo Supply Co., of Washington, D. C. was omitted as importers of the Norwood Meter. Summer heat was upon us. Apologies.

THE NEW YORK WORLD TELEGRAM & SUN
EXTRA-EXTRA

Peerless Camera Sold To Grayson-Robinson

Grayson-Robinson, specialty store chain, today announced the purchase of Peerless Camera Store, reportedly the world's largest volume photographic department store, for \$12.5 million.

Hyman P. Kuchal, president of Grayson-Robinson, said the purchase covered the business, trade-marks, good will, leasehold and other assets of Peerless at Lexington Ave. and 43rd St.

It was a cash deal.

"This is a major step forward in the expansion policy of Grayson-Robinson, which has been in force for the last few years," Mr. Kuchal said. "The Peerless Camera business, which has proved the advantages of discount photographic equipment sales, will be continued at its present headquarters."

Management will be retained at Peerless, Mr. Kuchal noted.

Lou Moss will continue as president. Herbert Ochshorn will remain as vice president in charge of merchandising. Jack Gottlieb will remain as vice president in charge of operations.

GIANT PEERLESS WAREHOUSE CONSOLIDATION SALE

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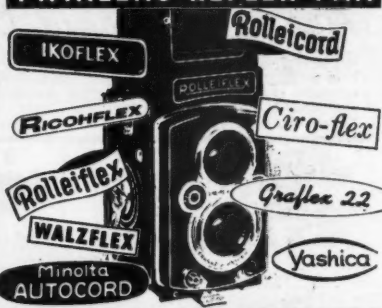
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SER. V	1.39	1.39	1.39	\$1.75	\$1.95	\$2.25	\$2.65
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the MOVIE MAKER

by MYRON A. MATZKIN

Dissatisfied with your color film results? Try exposure control and correction filters.



Experimentation is much of the fun for any movie maker. When it comes to exposure, however, too many of us always play by the rules. Of course, conventional exposure methods produce

pleasing color which often best fits the mood of your film. But occasionally, changing color balance can help add a missing accent to a scene.

There are at least two ways you can alter the color slightly in your movie—by using exposure control and/or filters.

Every film has a certain amount of latitude—the degree of under or overexposure that can be tolerated and still produce a good color image. Color films don't have as much latitude as black-and-white. Still, there's room in which to work. For example, you can over or underexpose Kodachrome about 1/2 stop without really hurting general quality. But this amount of over or underexposure can affect the color results measurably.

Underexposing Kodachrome produces deeper colors—with blue darkening more quickly than green, and red showing little difference.

If you overexpose Kodachrome, red again is little affected, while blue quickly loses color, becoming almost white. Overexposing tends to render hues in pastels.

Ansochrome colors tend to be less brilliant than Kodachrome. However, the same color balance changes are evident in under or overexposure.

Color correction filters

Results from gelatin color correction filters are quite different from those obtained from exposure alteration. Suppose you find that unwanted blue dominates the color pattern of a shot and you would like to correct it. A CC-Y filter (yellow) will tone down the blue and at the same time permit other colors to register more intensely. How much control you exercise over any color in the scene depends on filter strength, which can vary from 5 to 50. You'll also have to increase exposure

to compensate for the filter being used.

Here's what other gelatin color correction filters will do:

Filter	Colors it tones down
CC-M (Magenta)	Green
CC-C (Cyan)	Red
CC-R (Red)	Blue and green
CC-G (Green)	Blue and red
CC-B (Blue)	Red and green

How you use controlled exposure and color correction filters depends on your own personal tastes. A test roll or two will tell you quickly what effects you like and how much correction you want to exercise over film.

Black-and-white filters

Once you've gone as far as you can with color correction filters and exposure control, there are filters for black-and-white film with which you can experiment. You'll get one overall color, the color depending on the filter. A deep red filter will allow only red light to reach the film, so that all images will be different shades of red.

Various bits of cellophane or plastic, prisms, ridged glass and other materials used as filters may provide interesting color results.

If you experiment with pure color alone, without recognizable shapes and images, keep the films short. While an audience can be captivated by a short, well executed movie of this type, a long one often leads to boredom.—M.A.M.

Contests

Any good, interesting dog picture in black-and-white or color is eligible for the 11th annual Gaines Dog Research Center photo contest. A postcard request to the Gaines Dog Research Center, 250 Park Ave., New York 17, N. Y. will bring you a copy of the complete, official rules. Entries must be postmarked not later than midnight Sept. 5. First prize is \$500, second prize, \$250, third, \$100.

Entries for the Twelfth Annual International Zoo Photography Contest are due September 15. The contest is for the best pictures and color slides of any wild animal taken in any recognized zoo in the world. Prizes range from \$5 for honorable mention to \$50 for top winner in both print and slide sections. For entry forms and more information, write Mr. Chester Hart, Contest Chairman, The Chicago Zoological Society, Brookfield, Ill.

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16mm 50' Mag. Kodachrome	5.95	5.10

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(Fully Automatic Reflex Camera)

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Fits most models of AO, Ampro, Argus, B&H, Golde, Kodak, SVE, Turbo, Viewlex, etc. (Changer and adapter only.) Specify model.

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HOLDS 36 35MM SLIDES, PREVENTS WARPING, FRAYING. LIST 2.25
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Air luggage case for 24 only 7.95

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NO RELOADS

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Super Anscochrome 20 ex.	2.35	1.95
Anscochrome 20 ex.	1.85	1.49
Kodachrome 20 ex.	1.95	1.49
Kodachrome 36 ex.	2.75	2.09

SAVE ON 120-620 COLOR FILM

FRESH—LATEST DATING—FACTORY PACKED

NO RELOADS

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Kodachrome	1.25	.98 ea. .94 ea.
Anscochrome	1.25	.98 ea. .94 ea.
Kodachrome	1.25	.98 ea. .94 ea.
Super Anscochrome	1.75	1.45 ea. 1.38 ea.

* Specify Daylight or Indoor. May insert any 10 rolls. Processing .75 per roll—Kodak color prints 25c ea.

BRAND NEW 1956 MODEL ARGUS MATCH-MATIC C-3

f3.5 Lens, complete outfit with meter, flash & case.

List Price \$74.95
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Takes the guesswork out of enlarging, latest model. List \$15.00
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Flash Units—AC or Battery

List Special

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BRAND NEW ASAHI-PENTAX

35mm Single-lens reflex with instant return mirror, f2.3 50mm preset Takumar Flash sync. List \$195.00

Case List \$19.00 Add \$10.50
* SPECIAL **\$138.95**

BRAND NEW 35mm OPTIKON

1/500 sec., f2.8 45mm lens, MX sync, self timer, bright frame viewfinder, range-finder, auto counter, rapid lever, rapid re-wind, hinged back.

List with Case 79.45
* SPECIAL **42.95**

BRAND NEW TELETRON TAPE RECORDER

Portable, dual speed, precision electronic unit complete with microphone.

List 79.50
* SPECIAL **\$62.95**

BRAND NEW KODAK CAVALCADE SLIDE PROJECTOR

35mm or Super Slides, 500 watt turbo cooled 3.5 lens, handles all mounts, no slide popping complete with remote control cord and case. List \$149.50
* SPECIAL **\$112.95**

BRAND NEW LATEST MODEL 8MM TURRET MOVIE CAMERAS WOLLENSAK

5 Speeds, all 1.6 lenses, normal, W.A., telephoto. Built-in filters, single frame, continuous run.

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The most sensational development in the amateur movie field

NEVERE ELECTRIC EYE-MATIC—8mm Automatic Exposure Camera. (So simple even a child can operate) f1.8 lens, fade-in fade-out device, hinged back, low light warning signal. 4 wonderful models to choose from

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CA-3 single lens magazine...169.50 128.95
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The most useful complete automatic timer for your darkroom. Seconds, minutes, rings and cuts off enlarger or appliances.

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BRAND NEW KEYSTONE AUTOMATIC SLIDE PROJECTOR

Brighter, Simpler, Better

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BRAND NEW CANON 35mm CAMERAS

AT TREMENDOUS SAVINGS

	List	Special
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Canon L-1 with 50mm f2.8	\$259.00	\$172.00
50mm f1.8	315.00	215.00
Case for above	14.00	10.50

Write for details on other lenses at cut prices

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KODAK

ROLL FILM:
35MM, 20 exp
25MM, 24

48

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102

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RUS

102

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SUPER ANSCOCHROME ASA 100

High Speed—1959 Date
Orig. Factory Packed

35mm 20X list.....\$2.35 3 for \$5.95
120 list 1.75 3 for 4.45

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100 Sheet Packages Contrasts 1—2—3

	SW	DW
4 x 5	\$1.39	\$1.79
5 x 7	1.89	2.09
8 x 10	3.45	4.00

Slightly outdated

16mm SOUND PROJECTORS

Bell & Howell, Victor, Ampre

**SPECIAL
USED \$159.00**

AVAILABLE IN 8mm and 16mm THE FOLLOWING FULL VERSION REELS

The 8mm is approximately 200 ft. and 16mm approx. 400 ft. each reel.

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NEW JANITOR! MABEL'S BUSY DAY, FILM
JOHNNY, BETWEEN SHOWERS, CAUGHT IN
THE RAIN, HIS NEW PROFESSION. — 2
reels—IN THE BANK, NITE AT THE SHOW,
THE CHAMPION, THE TRAMP, HIS NIGHT
OUT, DOUGH AND DYNAMITE. The price for
silent is \$10.00 per reel and for sound
\$12.50 per reel. 8mm \$5.00 per reel.

MACK SENNETT BATHING BEAUTIES— Made direct from negatives

one-reelers \$10.00 per reel and \$20.00 for
two-reelers. Full version approx. 400 ft.
16mm each. 8mm \$5.00 per reel.

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Life of Christ 7 reels
Crown of Thorns 8 reels
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Sound \$15.00 per reel
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Snub Pollard & other famous stars, full ver-
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available in 8mm and 16mm \$5.00 for 8mm
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100' 16mm B&W.....\$1.25
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8mm 25' double color..... 1.25
16mm 100' roll color..... 2.50
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Above color prices refer to Ansco Color and
Anscochrome only.

35mm FILM

Ansco Color Daylight Outdated

100'\$11.95
20 exp. roll..... 1.00
(3 for \$2.75)

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- Brand New Daylight Film Loader
- 100' 35mm negative film our choice
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Yours for only **\$5.95**

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Portable Tripod Screens

With new VYNA-FLECT fabric. These screens
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30 x 40\$ 8.95
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50" Screens are shipped
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B & W 35mm Film 100' Roll

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A \$200.00 purchase will entitle you to a
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\$1.00.

A \$100.00 purchase will entitle you to a
Kodak Brownie camera for \$1.00.

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Kodak Brownie flash camera for \$1.00.

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This offer does not apply to purchases of
Anscochrome film.

ACCESSORIES

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One gallon size good for reversal pro-
cessing of paper and film.

Empty 16mm Magazines—3 for.....\$2.00

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16mm 100' camera spools and cans—
3 pair for..... 1.00

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for..... 1.00

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Cans for above each..... .50

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Cans for above each..... .50

8mm 400' reels—2 for..... 1.00

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Film cement, bottle..... .25

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ANSCO COLOR FILM WITH PROCESSING

8mm 25' dbl. roll reprocessed.....\$2.25

8mm 100' on Bolex Spool

reprocessed 6.50

16mm 100' roll 5.00

16mm 100' roll sound 5.00

16mm 50' Magazine 3.50

Slightly Outdated

USED CLEARANCE SALE

16mm Subjects Approx. 400' available in
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For Home Use Only **\$4.95**

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8mm 25' dbl. roll.....\$1.15
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16mm 100' roll 2.50
16mm 100' sound ASA 24..... 2.50
16mm 50' Magazine 1.90
With purchase of 5 rolls, 1 roll free.

16mm KODACHROME

100 ft. rolls—processing included. Slightly
outdated. Developed by Eastman Kodak.
Reg. \$10.00. Price \$6.00 per roll.
Slightly Outdated

SPECIAL ON NEW 8mm AND 16mm SUBJECTS (Cartoons, Comedies and Westerns) BLACK AND WHITE SUBJECTS Made direct from negatives

50' 8mm\$ 1.00
200' 8mm 3.50
100' 16mm 2.00
400' 16mm (silent) 7.50
400' 16mm (sound) 10.00

ANSCOCHROME ASA 32 16mm with Processing

100' 16mm roll\$8.00
50' 16mm Mag. 6.50
Orig. factory packed 1959 dated

COLORCHROME

8mm Roll ASA 32.....\$3.25
with Processing within date

MOVIE FILM SPECIAL ASA 50

Reperforated

4 25' double 8mm on camera
spools\$ 1.79
16 rolls as above 5.95
64 rolls as above 22.00
15 rolls 16mm 100' on camera
spools 17.95
27 rolls as above 29.00
54 rolls as above 48.00

NO PROCESSING ON ABOVE
Slightly outdated

BULK MOVIE FILM ASA 50 NO PROCESSING

15 16mm 25' rolls.....\$ 2.75
27 rolls as above 4.75
54 rolls as above 8.75
15 16mm 50' rolls..... 5.95
27 rolls as above 10.75
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400' 8mm or 16mm..... 3.60

ROLL FILM

127, 120, 620, 116, 616, Black and
White ASA 80—5 for.....\$1.00
20X 35mm B&W ASA 50—4 for 1.00
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16mm 4c per ft.—Minimum order 50'
8mm 25' on camera spool.....\$1.25
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35mm x 100'\$11.95
35mm x 50' 6.50
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Kodak FILM FREE

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8-12 or 16 Exposure roll developed - printed . . .	8-12 or 16 Exposure roll developed - printed . . .
69¢	36¢
plus FREE roll of film	FREE roll of color film

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Rush my **FREE FILM**, one for each roll I send.
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SAVE MONEY SAVE TIME

8mm Spool	\$1.00
8mm Magazine (with mag)75
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16mm 50 ft. spool	1.50
16mm 50 ft. Magazine (with mag)	1.00
16mm 100 ft. spool	2.50
FREE Mailing Labels for above, just mention 8mm spool or 8mm Mag., 16mm spool or 16mm Mag.	
35mm 20 Exp. Slide Mtd. \$1.00	
35mm 36 Exp. Slide Mtd.	1.75
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Stereo 20 Pair Mtd.	2.50
625 Mtd.80
Also Ektachrome and Anacolor 35mm & 828	
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828 • 127 • 620 • 120 • 616 • 116	
ANY 6-8 EXP. ROLL DEVELOPED AND 1 OVERSIZE PRINT OF EACH GOOD NEG. \$2.50	
Any 10-12 Exp. Roll Dev. & Printed \$3.50	
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8mm & 16mm B&W Processing, Lowest Rates	
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DISCOVERY

(Continued from page 82)

on assignment, but left to his own devices prefers to work in the essay form. Shustak has lived all his life in the city, and his subjects are city people and their environment. The picture, lower right, page 83, is from an essay he is now preparing on street games. Big city children play games entirely foreign to the greener pastures of suburbia. They are of a type suited to the asphalt and brick of city streets—with their ubiquitous “no ball playing” signs, and the persistent interruption of automobiles and small passersby.

Since he prefers (about 90 percent of the time) to shoot with a Leica M3, he likes to fill as much of the small frame as possible. He will move in, if necessary, rather than rely on cropping in the darkroom later on. He finds that reactions to the camera vary all the way from hostility to curiosity to bored sophistication. Particularly he finds children oblivious of the camera eye. However, when sophistication fails and they flock about with the familiar cry, “Take my picture”—he obliges. He’ll return another day, when the camera has lost its importance, to get the pictures.

Lawrence Shustak’s approach to pictures is a gentle, perceptive and understanding one. Perhaps one word, more than any other describes his work—refreshing.—M. T.

Free Literature

Edmund Scientific Co. has available an 80-page catalog with 100 illustrations of more than 1,000 optical items, including lenses, prisms, telescopes, microscopes, binoculars, and hard-to-find optical items. For your free copy, write Edmund Scientific Co., Barrington, N. J.

In a 6-page, punched-to-fit-the-Kodak-Data-Book pamphlet the Kodak Co. presents a guide to exposure with portable electronic flash units. “To get a truly meaningful guide number,” the pamphlet says, “the owner of an electronic flash unit should formulate one by actual photographic test,” and forthwith suggests one. In addition, it mentions possible filters and gives other pertinent information. For your free copy, write to Sales Service Division, Eastman Kodak Co., Rochester 4, New York.

A technical report describing the characteristics of the new Phenidone-based Clayton Film-All developer can be obtained from the Clayton Chemical Co., 2100 Dempster St., Evanston, Ill.

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KODACOLOR	KODACOLOR
8 EXPOSURE ROLLS \$2.50	12 EXPOSURE ROLLS \$3.50
Developed and enlarged to size 3 1/2 x 5	Developed and enlarged to size 3 1/2 x 3 1/2
Regular Price \$3.46	Regular Price \$4.74

25c cash credit for each negative not printed

KODACOLOR REPRINTS	KODACOLOR ENLARGEMENTS
25c each	5x7 \$1.25 8x10 \$2.75
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MAIL ORDERS to
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Brooklyn 28, N. Y.

MODERN TESTS

(Continued from page 89)

finder-rangefinder it's much the same as the Retina IIIc—good solid metal casting for a body, one of the most accurate built-in LVS meters around with amazing sensitivity in poor light conditions, a single-stroke rapid wind lever located on the bottom of the camera because the top of the camera is occupied with said meter, and one of the very best picture frame counters. It locks after the last picture is taken so you can't attempt to make picture number 21 or 37, thereby pulling the film end off its spool and out of its cassette. Very nice idea and, incidentally, exclusive on the Retinas for some years.

Not much sense in testing the lens and shutter. If you don't know about the reputation and reliability of the Schneider lenses and Compur shutter, we're sorry for you. They are first class.

The camera took quite a banging around while we field tested it. For some unaccountable reason, the meter and camera continued to operate properly after several ghastly falls. Cheers also for the imitation leather covering which fails to scuff in tests where genuine leather would come off by the handful.—H.K.

POLARIFLASH HELPS GET BETTER COLOR

Specifications: Enteco Industries Polariflash polarizing shield for flashguns and electronic flash units. **Size:** 5 1/4 in. **Mount:** Spring clamp. **Construction:** Laminated glass. **Price:** \$9.95. **Manufacturer:** Enteco Industries, Inc., 610 Kosciuszko St., Brooklyn 21, N. Y.

The Polariflash polarizing shield slipped in front of your regular flashgun or electronic flash reflector serves to cut out light vibrations in all but one direction. The immediate effect of polarizing the light when shooting color film is warmer, deeper color that appears to add great detail to transparencies of paintings, glassware, and even polished woods. We found the unit particularly effective for flash portraits of people wearing glasses. It does away with the glare that often results from direct flash on spectacles. We found that the addition of a polarizing screen over the lens provided maximum control over the polarizing effect. One such device, the Enteco Polarivue, has a supplementary viewer which shows the polarizing effect of the screen as it's rotated. The combination of the screen over the lens and the Polariflash on the flash reflector requires about two stops more exposure.

—M.A.M.

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GRLAB MODEL 168 ALL PURPOSE DARKROOM TIMER

SYNCHRONOUS ACCURACY IN SECONDS for automatic enlarger switching control... IN MINUTES for film processing. PLUS ALL THESE FEATURES IN ONE TIMER! Range from 1 second to 60 minutes in seconds... Giant 8" luminous dial... Automatic buzzer alarm... Dependable electric motor... Ideal for color film.

SEE IT AT YOUR PHOTO DEALER TODAY!
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FREE FILM BLACK & WHITE OR KODACOLOR

HERE'S ALL YOU DO:



Mail us your exposed rolls of either black and white or color film and enclose the low cost of developing and printing.

We will develop and print your roll, and quickly mail back JUMBO PRINTS in a folder, and at no extra cost, you receive a FREE ROLL of factory-fresh Black and White or KODACOLOR same size film, and a film-mailer envelope for your next order with price list on all other services. COMPARE OUR GUARANTEED QUALITY! Our reputation as specialists in only mail order photo-finishing since 1928 stands behind this offer!

Offer limited to 127, 120, 620 film.

One price to pay... no extras! We pay return postage!

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Dept. MP-9, Irvington, N. Y.

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BLACK/WHITE 8-12 or 16 Exposure Roll **69¢** KODACOLOR 8-12 or 16 Exposure Roll **\$3.69**

Print your name clearly, send Cash, Check or M.O. to Philip's Foto Co. SATISFACTION GUARANTEED OR YOUR MONEY BACK! Hurry-Free Film Is Waiting!

<p>*****</p> <p>FILM ECONOMY—COLOR & BW</p> <p>*Proc. incl. KODACHROME Daylight*</p>			
35mm x 20 exp.	\$2.25 ea.	3 for \$6.25	
35mm x 36 exp.	\$3.25 ea.	3 for \$9.25	
* Proc. incl. COLOR MOVIE FILM—DAY OR TUNG.			
8mm x 25' dble roll	\$2.25 ea.	3 for \$6.25	
8mm x 25' dble mag	2.75 ea.	3 for 7.50	
16mm x 50' mag	3.95 ea.	3 for 10.95	
16mm x 100' roll	4.95 ea.	3 for 13.95	
FRESH KODACHROME—FRESH BLACK & WHITE			
(Proc. incl.)	Kodachrome	Plus X	Tri-X
8mm x 25' dble roll	\$2.25	\$1.25	\$2.25
8mm x 25' dble mag	3.40	1.85	2.60
8mm x 100' dble	10.75	3.75	5.45
16mm x 50' mag	5.25	1.85	3.25
16mm x 100' roll	7.95	2.85	5.45
SUPER ANSCOCHROME			
ASA 100 35mm x 20 exp.	\$2.60 ea.	3 for \$7.30	
ASA 400 35mm x 20 exp.	\$3.15 ea.	3 for \$8.85	
ASA 100 16mm x 100 (no proc.)	\$5.95		
ASA 100 120 roll (no proc.)	\$4.10		
ANSCOCHROME ASA 32			
35mm x 20 exp. (proc. incl.)	\$2.35 ea.	3 for \$6.90	
35mm x 36 exp. (proc. incl.)	\$3.40 ea.	3 for \$9.75	
16mm x 100 (no proc.)	\$5.45		
MOVIE FILM—QUANTITY DISCOUNTS			
SAW ASA 60 REVERSALS, NO PROCESSING			
8mm x 400' dble	\$6.95	8mm x 1000' dble	\$12.95
Camera spooled	54 Rolls	27 Rolls	15 Rolls
16mm x 50'	\$10.95	\$10.95	\$5.95
16mm x 100'	45.00	25.00	13.00
ASA 40 Aero EKTACHROME ASA 40			
With 1 1/2 gal proc kit	91/2x7 1/2" with 4 1/2 gal.		
5 1/2 x 40'	\$4.75	proc. kit & filters	\$9.95
5 1/2 x 20'	\$6.50		
EXTRA—Free compensating	SPECIAL—4 1/2 gallon		
filter with any of above.	Ektachrome processing		
	kit		\$2.50
BLACK & WHITE MOVIE PROCESSING SERVICE			
8mm x 25'	\$1.85 ea.	16mm x 100'	\$1.00 ea.
16mm x 50'			.65 ea.
KODACHROME PROCESSING			
35mm x 20 exp. mtd.	\$1.00	8mm x 25' mag	.65
35mm x 36 exp. mtd.	\$1.75	16mm x 50' mag	\$1.00
8mm x 25' dble roll	\$1.00	16mm x 100' roll	\$2.50
EQUIPMENT BARGAINS			
8mm MATCHED LENS SETS			
7mm f2.5 FF w/A 1 1/4"	List	Our Price	
f2.5 F.W. Tele	\$49.50	\$19.50	
6.5mm f2.5 FF w/A 3 1/2"	List	Our Price	
f1.9 F.W. Tele	\$69.50	\$27.50	
Individual f1.9 tele or w/a lenses	\$14.00 ea.		
HI-PI TAPE			
HI-PI TAPE 1200'	\$1.75	1800'	\$1.99
MINOLTA CAMERAS			
35mm MINOLTA A w/case	List \$87.90—		
	Our Price \$39.95		
35mm MINOLTA A-2 w/case	List \$79.90—		
	Our Price \$52.95		
2 1/4 sq. MINOLTA AUTOCORD w/case	List \$109.45		
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Please let me know by return mail what is available and price quotation.

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Orig. Factory Packed

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100 Sheet Packages
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16mm SOUND PROJECTORS

Bell & Howell, Victor, Ampro

SPECIAL
USED **\$159.00**

AVAILABLE IN 8mm and 16mm

THE FOLLOWING FULL VERSION REELS

The 8mm is approximately 200 ft. and 16mm approx. 400 ft. each reel.

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NEW JANITOR! MABEL'S BUSY DAY, FILM
JOHNNY, BETWEEN SHOWERS, CAUGHT IN
THE RAIN, HIS NEW PROFESSION. — 2
reels—IN THE BANK, NITE AT THE SHOW,
THE CHAMPION, THE TRAMP, HIS NIGHT
OUT, DOUGH AND DYNAMITE. The price for
silent is \$10.00 per reel and for sound
\$12.50 per reel. 8mm \$5.00 per reel.

MACK SENNETT BATHING BEAUTIES—
Made direct from negatives
one-reelers \$10.00 per reel and \$20.00 for
two-reelers. Full version approx. 400 ft.
16mm each. 8mm \$5.00 per reel.

Religious Films Available
Life of Christ 7 reels
Crown of Thorns 8 reels
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Sound \$15.00 per reel
8mm \$7.50 per reel

HAL ROACH COMEDIES—
Snub Pollard & other famous stars, full ver-
sion—available in 8mm approx. 200 ft. \$5.00
per reel—16mm \$10.00 silent per reel and
\$12.50 sound. Approx. 400 ft.

ORIGINAL OUR GANG COMEDIES—
available in 8mm and 16mm \$5.00 for 8mm
approx. 200 ft. \$10.00 per reel for 16mm
silent approx. 400 ft. per reel—available in
1 and two reelers.

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100' 16mm B&W.....	\$1.25
8mm 25' double B&W60
8mm 25' double color	1.25
16mm 100' roll color.....	2.50
16mm 50' Mag. color.....	1.25

Above color prices refer to Ansco Color and
Ansochrome only.

35mm FILM

Anso Color Daylight Outdated

100'	\$11.95
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(3 for \$2.75)

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- Brand New Daylight Film Loader
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40 x 40	9.95
37 x 50	13.95
50 x 50	14.95

50" Screens are shipped
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B & W 35mm Film 100' Roll
Negative film outdated.....\$1.25

FILM SPECIAL FILM SPECIAL FILM SPECIAL

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A \$200.00 purchase will entitle you to a
Kodak Brownie camera and projector for
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A \$25.00 purchase will entitle you to a 127
camera and 10 rolls of 127 film free of extra
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This offer does not apply to purchases of
Ansochrome film.

ACCESSORIES

CHEMICAL KITS—D88	\$1.00
One gallon size good for reversal pro- cessing of paper and film.	
Empty 16mm Magazines—3 for.....	\$2.00
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16mm 100' camera spools and cans— 3 pair for.....	1.00
35mm cartridges or cans—one dozen for	1.00
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8mm 25' dbl. roll reprocessed.....	\$2.25
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16mm 100' roll	5.00
16mm 100' roll sound	5.00
16mm 50' Magazine	3.50

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16mm 50' Magazine	1.90

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SPECIAL ON NEW 8mm AND 16mm SUBJECTS (Cartoons, Comedies and Westerns) BLACK AND WHITE SUBJECTS Made direct from negatives

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200' 8mm	3.50
100' 16mm	2.00
400' 16mm (silent)	7.50
400' 16mm (sound)	10.00

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100' 16mm roll	\$8.00
50' 16mm Mag.	6.50

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8mm Roll ASA 32.....	\$3.25
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27 rolls as above	29.00
54 rolls as above	48.00

NO PROCESSING ON ABOVE
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27 rolls as above	4.75
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400' 8mm or 16mm	3.60

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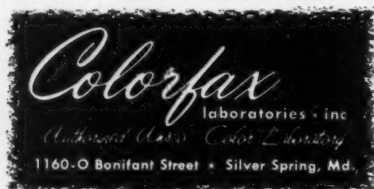
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modern COLOR

by NORMAN ROTHCHILD

Try lowering your film indexes and altering development for better color slides and color prints.



When a new film is announced, black-and-white or color, everybody immediately goes about asking how high an exposure index can be used if the film is "pushed" in development.

Well, you can't "push" Kodachrome (would that you could) but Ektachrome, Ansochrome and Super Ansochrome "push" nicely, the latter as high as 400 for ASA calibrated meters. The color suffers a bit, sure, but it's good and it's usable and you get pictures where you couldn't before.

But what happens if you try the opposite—use a lower than normal exposure index and develop accordingly?

I've been doing quite a bit of experimenting along this line and the results are well worth the effort.

If you shoot and process for lower than normal exposure indexes, you can lower transparency contrast.

Here's how it works in practical terms. Suppose you're shooting under contrasty summer sunlight or trying a windowlight shot using harsh artificial light. In either situation you would normally need a reflector or fill-in flash or flood. However, overexposure plus special, shorter processing times will tend to help retain much detail in both shadow and highlight areas which standard techniques would lose.

Lower inherent contrast will also aid in producing better color slide duplicates or color prints. My tests show

that far less blocking of highlights and shadows is evident in "dupes" made from low-contrast transparencies. There is also less danger of color shift or distortion. In prints you get a far better range of tones and better color in highlight and shadow areas.

Tests further show that color film exposed at lower than normal indexes has wider latitude, or leeway in exposure, than films processed and exposed normally. The extended latitude ranges from 1 to 2 extra stops, depending on whether the film was exposed at 1/2x the normal or 1/4x the normal rating. With this increased latitude your chances of perfect exposure increase.

Seen by themselves, transparencies made by overexposing and developing specially, may seem quite ordinary. A comparison with those made by normal methods, however, will show what you've gained.

Extra shadow detail

Look for extra shadow detail and highlight detail in the "overexposed" transparencies. You'll also see that the maximum shadow density is darker and richer. Don't mistake this extra extreme shadow density as an increase in overall contrast. It indicates that the tonal range has been extended.

Using lower than normal film speeds works well in contrasty lighting situations or when the subject contains bright rich color. On dull days, however, in the shade or when the colors of your subject are weak, your transparencies may appear too washed out.

The following tables give special processing times and needed filtration for Ansochrome, Super Ansochrome and Ektachrome E-2 films. Try it yourself or ask your color processor to alter the developing times when he processes your film.—THE END.

Film	Exposure Index	1st Dev.	Color Dev.	Filter
Ansochrome	8	9 min.	9 min.	
	16	12 min.	12 min.	
	32 Normal	16 min.	14 min.	
Super Ansochrome	50	12 min.	12 min.	
	100 Normal	16 min.	14 min.	
Ektachrome E-2 Daylight Type	10	7 min.	15 min.	CC.05 or CC.10 Blue
	16	8 min.	15 min.	CC.05 or CC.10 Blue
	32 Normal	10 min.	15 min.	
Ektachrome E-2 Type F	10	8 min.	15 min.	.05R

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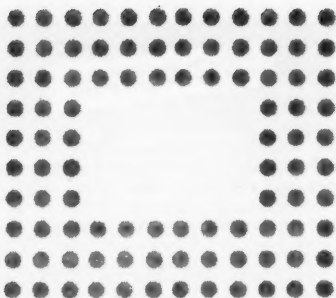
Thousands of new customers bought from us this year. Some didn't even read our ads. They say their friends told them about us. The reason is that our prices are lower than what you may pay in your home town — or even in the countries where they are made! Practically every brand and type of camera, lens, accessory from Europe and Japan is available at tremendous discounts. Our large volume and rapid turnover plus direct sales with no time payment expenses — add up to tremendous savings for you!

We carry one of the largest inventories of cameras and photographic equipment in this country. We can supply from stock not only 35mm Cameras, Reflex, Press, View, and Folding Cameras, Enlargers, 8mm and 16mm Movie Cameras and Projectors, Slide Projectors, and Screens, but also their accessories, such as Close-up Equipment, Filters, Flash Equipment, Flash Bulbs, Film and over 10,000 Lenses available — also Binoculars and Telescopes!... **WE WILL NOT BE UNDERSOLD!**

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35MM CAMERAS		Kodak Signet 40.		Toyoka 35 f2.8.		Keystone K-75 f2.5		Keystone K-102 f1.9		EXPOSURE METERS		Braun Hobby	
Aires IIC f1.9.	62.50	Kodak Signet 50.	62.00	Vito B f3.5.	44.00	Keystone K-33 f2.5	58.50	Revere C102 f1.9.	146.00	Alpax	5.95	Special	59.50
Aires IIA f1.9.	68.00	Konica III MXL	62.00	Vito BL f2.8.	69.00	Keystone K-38 f2.5	69.50	Revere C-37 f1.9.	146.00	Argus L-3	12.50	FR Model 2.	37.50
Aires Ambis-Silette f2.8	96.75	Leotar f2.	44.95	Vito BL f3.5.	58.00	Keystone K-42 f2.5	58.50	Argus L-44	13.50	Argus L-44	13.50	FR Model 140.	21.95
Agfa Silette-St. f2.8	74.50	Lord V8 f1.9.	74.50	Vito IIA f3.5.	44.00	Keystone K-48 f2.5	84.00	Argus 300	29.50	Bewi automatic	19.25	Kiko strobe unit.	19.95
Agfa Super-Silette f2.8	74.50	Lordomat f2.8.	64.50	Vito BR	*	Kodak Brownie	22.50	Argus 300 Auto.	43.95	Bewi automatic B	22.50	Mecablit 100	37.50
Anso Super f3.5	31.00	Mamiya Mag. 35.	*	Vitessa L f2.8.	*	Kodak Brownie	29.95	Argus 500	58.50	Bewi automatic C	22.50	Minicam 80	45.00
Anso Super f3.5	31.00	Minolta A2 f2.8.	*	Vitessa L3.5	*	Kodak Brownie	29.95	B & H 708 Duo	64.95	G. E. Guardian	23.40	Minicam 40	32.00
Anso Super f3.5	31.00	Minolta Super A f2	195.00	Vitessa L f2.	*	Turret f2.3.	44.95	B & L Balomatic 300	64.95	GE Golden Crown	23.50	RI III	29.95
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Anso Super f3.5	31.00	Miranda f1.9 auto.	195.00	B & H Vivid f3.5.	75.00	Kodak Medalion	89.95	Director	19.00	Kalimar B1	5.50	Ultrablitz Rocket	39.50
Anso Super f3.5	31.00	Miranda f1.9 auto.	195.00	B & H Vivid f3.5.	75.00	Kodak Medalion	89.95	Director	19.00	Kalimar B1	5.50	Ultrablitz Rocket	39.50
Anso Super f3.5	31.00	Miranda f1.9 auto.	195.00	B & H Vivid f3.5.	75.00	Kodak Medalion	89.95	Director	19.00	Kalimar B1	5.50	Ultrablitz Rocket	39.50
Anso Super f3.5	31.00	Miranda f1.9 auto.	195.00	B & H Vivid f3.5.	75.00	Kodak Medalion	89.95	Director	19.00	Kalimar B1	5.50	Ultrablitz Rocket	39.50
Anso Super f3.5	31.00	Miranda f1.9 auto.	195.00	B & H Vivid f3.5.	75.00	Kodak Medalion	89.95	Director	19.00	Kalimar B1	5.50	Ultrablitz Rocket	39.50
Anso Super f3.5	31.00	Miranda f1.9 auto.	195.00	B & H Vivid f3.5.	75.00	Kodak Medalion	89.95	Director	19.00	Kalimar B1	5.50	Ultrablitz Rocket	39.50
Anso Super f3.5	31.00	Miranda f1.9 auto.	195.00	B & H Vivid f3.5.	75.00	Kodak Medalion	89.95	Director	19.00	Kalimar B1	5.50	Ultrablitz Rocket	39.50
Anso Super f3.5	31.00	Miranda f1.9 auto.	195.00	B & H Vivid f3.5.	75.00	Kodak Medalion	89.95	Director	19.00	Kalimar B1	5.50	Ultrablitz Rocket	39.50
Anso Super f3.5	31.00	Miranda f1.9 auto.	195.00	B & H Vivid f3.5.	75.00	Kodak Medalion	89.95	Director	19.00	Kalimar B1	5.50	Ultrablitz Rocket	39.50
Anso Super f3.5	31.00	Miranda f1.9 auto.	195.00	B & H Vivid f3.5.	75.00	Kodak Medalion	89.95	Director	19.00	Kalimar B1	5.50	Ultrablitz Rocket	39.50
Anso Super f3.5	31.00	Miranda f1.9 auto.	195.00	B & H Vivid f3.5.	75.00	Kodak Medalion	89.95	Director	19.00	Kalimar B1	5.50	Ultrablitz Rocket	39.50
Anso Super f3.5	31.00	Miranda f1.9 auto.	195.00	B & H Vivid f3.5.	75.00	Kodak Medalion	89.95	Director	19.00	Kalimar B1	5.50	Ultrablitz Rocket	39.50
Anso Super f3.5	31.00	Miranda f1.9 auto.	195.00	B & H Vivid f3.5.	75.00	Kodak Medalion	89.95	Director	19.00	Kalimar B1	5.50	Ultrablitz Rocket	39.50
Anso Super f3.5	31.00	Miranda f1.9 auto.	195.00	B & H Vivid f3.5.	75.00	Kodak Medalion	89.95	Director	19.00	Kalimar B1	5.50	Ultrablitz Rocket	39.50
Anso Super f3.5	31.00	Miranda f1.9 auto.	195.00	B & H Vivid f3.5.	75.00	Kodak Medalion	89.95	Director	19.00	Kalimar B1	5.50	Ultrablitz Rocket	39.50
Anso Super f3.5	31.00	Miranda f1.9 auto.	195.00	B & H Vivid f3.5.	75.00	Kodak Medalion	89.95	Director	19.00	Kalimar B1	5.50	Ultrablitz Rocket	39.50
Anso Super f3.5	31.00	Miranda f1.9 auto.	195.00	B & H Vivid f3.5.	75.00	Kodak Medalion	89.95	Director	19.00	Kalimar B1	5.50	Ultrablitz Rocket	39.50
Anso Super f3.5	31.00	Miranda f1.9 auto.	195.00	B & H Vivid f3.5.	75.00	Kodak Medalion	89.95	Director	19.00	Kalimar B1	5.50	Ultrablitz Rocket	39.50
Anso Super f3.5	31.00	Miranda f1.9 auto.	195.00	B & H Vivid f3.5.	75.00	Kodak Medalion	89.95	Director	19.00	Kalimar B1	5.50	Ultrablitz Rocket	39.50
Anso Super f3.5	31.00	Miranda f1.9 auto.	195.00	B & H Vivid f3.5.	75.00	Kodak Medalion	89.95	Director	19.00	Kalimar B1	5.50	Ultrablitz Rocket	39.50
Anso Super f3.5	31.00	Miranda f1.9 auto.	195.00	B & H Vivid f3.5.	75.00	Kodak Medalion	89.95	Director	19.00	Kalimar B1	5.50	Ultrablitz Rocket	39.50
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Anso Super f3.5	31.00	Miranda f1.9 auto.	195.00	B & H Vivid f3.5.	75.00	Kodak Medalion	89.95	Director	19.00	Kalimar B1			



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THE LARGE CAMERA

(Continued from page 36)

1. Tape a strip of stiff paper to the camera bed in such a way that you can mark on it the positions of the distance pointer connected with the camera front.

2. Use a foot rule divided into inches as a "test chart."

3. Mount your camera, equipped with either a standard lens or any desired "close-up" lens, on a tripod at such a distance from the foot rule that the image of the rule appears *exactly one inch long* on the ground glass. Mark the corresponding position of the distance pointer on the paper with a short line across the strip. Write directly above this line "1/12" (to indicate that in this position rendition is 1/12 natural size), and directly below this line "1 1/4" (to indicate that the exposure meter reading must be multiplied by a factor of one and one-quarter to produce a correctly exposed negative).

4. Progressively, continue to mark the different image scales as follows: focus the ruler so that it appears *exactly three inches long* on the ground glass, mark the distance pointer position with a line, write "1/4" above it, "1 1/2" below it (to indicate that in this position the image scale is one-quarter natural size and the exposure factor is one and one-half). Similarly, focus the ruler so that six inches appear *exactly three inches long* on the ground glass, mark the pointer position, write "1/2"

above the line, "2 1/4" below it. Next, focus the ruler so that three inches on the scale appear exactly three inches on the ground glass, mark pointer position, write "1:1" above the line (to indicate rendition in natural size), "4" below it (to indicate exposure factor of 4). Next focus the ruler so that two inches appear exactly *three inches long* on the ground glass, mark pointer position, write "1 1/2 X" above the line (one and one-half times magnification), "6" below (exposure factor).

5. If your bellows extension is sufficiently long, or the focal length of your lens sufficiently short, mark the following positions: Twice natural size, exposure factor 9. Three times natural size, exposure factor 16. Four times natural size, exposure factor 25. Five times natural size, exposure factor 36. Six times natural size, exposure factor 49. And so on.

6. Beginning with zero at a definite, convenient position on your camera bed, transfer all readings to a flat strip of wood (shaped like a ruler). Make such a scale for every lens you intend to use for close-up photography.

7. When you want to take a close-up of a specific subject, first decide the most suitable scale of rendition, then set your lens accordingly by using your calibrated stick. Read off the exposure factor by which you must multiply the reading taken with an exposure meter, focus by moving the entire pre-focused camera back and forth until the image appears sharp on the ground glass, and make the shot. That's all there is to it.—THE END

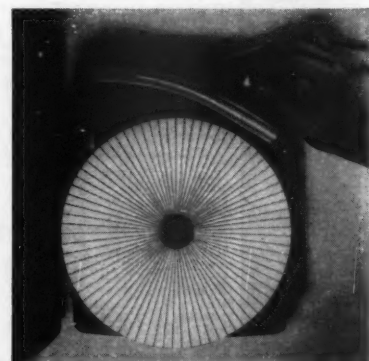
Have Trouble Stopping Action? Shutter Lag May Be Your Problem

If your high shutter speeds (1/200 to 1/500 sec.) haven't seemed fast enough to stop action, your shutter's time lag may be the culprit.

Briefly, time lag is the length of time your shutter takes to open fully and close fully (see Diagram 1 page 50). Given shutter speeds will be inaccurate if the shutter takes too long to open and close. Exposure times most affected by the overlong time lag are the fast speeds. The reason—at slow speeds (1/25, 1/50, 1/5, etc.) shutter time lag is an insignificant amount of the overall exposure, so at these slow speeds the slight increase of exposure doesn't affect the final photograph visually. Fast speeds are a different story. If the shutter lag at 1/100, 1/200, 1/500 sec. is even slightly excessive, the actual shutter speed will be slower, producing improper exposure. For example, suppose your actual set shutter speed is 1/500 sec. and your shutter lag is excessive. Your shutter isn't opening and closing fast enough so there will be additional

time added to the 1/500. Instead of 1/500 sec. you'll actually get 1/250, or perhaps 1/100. Not only will your action pictures be blurred, but the excessive time lag can cause overexposure.

(Continued on page 114)



Make test disc from heavy cardboard. Draw circle 9 1/4 inches diameter. Use India ink. Draw lines to center with 3/16 in. between lines at circumference.

AWON FILM DISCOUNTS !!!

SAVE MONEY—Unless otherwise specified, all film and paper is government surplus, outdated, respoled and repacked to bring you bargain prices.

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16mm x 100'	2.50
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16mm x 100', Sound, ASA 50	3.40
16mm x 50' roll, Plus X	1.50
16mm x 100' Kodak Super XX ASA 100	2.00
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16mm x 100' Sound Perf	2.25
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KODAK RETINA IIC 35mm. f2 w/case (discontinued)	112.95	112.95
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KODAK STEREO camera	89.50	87.50
KODAK DIAPLEX IV flash outlt.	25.25	16.95
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KODAK PONY 135 model IV outlt.	38.40	41.95
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KODAK RETINA REFLEX 35mm. f2. w/case		139.95
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KODAK "300" w/Airquit chgr.	74.50	52.50
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9 1/4 x 7 1/2" 1.00	10 1/4 x 10" 1.45

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Plus X or Super XX or Tri-X or Infrared Red or Microfilm 6 for \$1.50; 12 for \$2.50

BRAND NEW! For 8mm, 16mm and 35mm MORSE G-3 DEVELOPING OUTFIT

List \$34.50 AWON PRICE—\$24.95

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127 & Super slide cardboard mounts	1,000 for \$10.00
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100 for \$3.50	
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B&W—Original Kodak package—Fresh—Bargain
127, 120 or 620 . . . \$4.25
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35mm x 20 exposures . . . Plus X—8 for \$3.90
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36 glass plates per box
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4x3 Kodak Infra Red (100 shts)	\$1.00
10x12 E.K. Commercial (10 shts)	1.98
11x14 Contrast Proc Pan (10 shts)	1.98
4x3 Anasco Proc (25 shts)	3 for \$3.80
8x10 E.K. Contr Proc Pan or Anasco	
Process (25 sh)	\$1.98
8x10 E.K. Infra Red (100 shts)	3 for \$8.95

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8x7 Ektachrome (10 shts)	2.95
8x10 Anasco Color (10 shts)	3.95 ea. 3 for \$10.00
8x10 Ektacolor (10 shts)	1.95

10x12—Original Box of 10 sheets—88c
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11x14—Original Box of 12 sheets—98c
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16mm x 100'. Original Anasco pack. 3 for \$5.95

Include 20% deposit on all C.O.D. orders. All film and paper are outdated and sold as is. All footage approximate. Prices subj. to change without notice.

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4x5" SWGL (200 shts) #3 . . .	\$1.00
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8x10" LWSM #1 . . .	(100 shts) 1.00
8x10 AZO DW Lustre #3 . . .	(100 shts) 3.50
10x10 SWSM #1, 2 . . .	(250 shts) 1.95
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1,000 shts . . . 22.50

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New! Anso Super Hypan
Black & White Sheet Film
2 1/4 x 3 1/4 (box of 25 sheets) 3 for \$9.
4x5 (box of 25 sheets) 3 for \$9.

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Out dated
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35mm KXA reflex (disc) 120 stand lens, case 54.95
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MINOLTA Auto-Scope 8mm/16mm, list \$80.95 97.50
SPOT-O-MATIC enlarging meter, list \$12.50 14.95
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list \$141.45 120.50
Premier Prof. Tiller 25.95
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	List	SALE
Quick Set Champ II, 3 Sect., Elev., w/Pan Head	\$34.00	\$22.95
Quick Set Husky II, 3 Sect., Elev.	47.00	32.95
Star C-18, 3 Sect., w/Pan Head	15.40	8.97
Star D Conquest, 3 Sect., Elev., w/Pan Head	81.50	13.30
Continental Mark III, 3 Sect., w/Swing Over Tilt and Monopod	25.95	16.95
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- 70mm x 100' Super XX or Infra Red film \$ 3.95
- 120 & 320 Kodacolor 3 for 3.00
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- 1000 for 26.50
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- ANSCO 100 All Weather Pan 12 for 3.50
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50% DISCOUNT off list—for 8mm movie SOLIGOR LENS SETS

	List	AWON PRICE
7mm f2.5 FF w/A	56.90	\$28.45
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6 1/2mm f3.9 FF w/A	83.90	\$41.95
1 1/2" f3.9 F.M. Tele	83.90	\$41.95

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- All metal slide case for 12 trays
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AWON SALE—all for only \$6.99

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- For Tray & Magazine
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- 12 Airquest slide trays (hold 36 slides each) \$16.95

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List	SPEC
\$9.95—Allox Direct Reading w/case	\$5.95
Seikon Leader Deluxe, Model 38, w/built-in booster cell and case	9.95
Seikon Leader Deluxe, w/case	6.50
Booster Cell for Seikon Leader	3.95
Seikon Compact, w/case	6.50
DeJure 58 Meter w/case	only 4.95
PE Meter w/booster & case	5.95
G.E. Mascot II	4.95
GE PR-3 w/case (discontinued)	15.95
35.50—Weston Master III w/case	21.45
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Weston 58, Dir. Reading	12.95
Case for any of above	1.95

All equip. brand new. Prices subj. to change without notice.

EXCLUSIVE—RADIANT Portable Tripod Screens Crystal beaded 1958 Model

With new YVNA-SELECT fabric. These screens are fireproof, fungus proof, and washable. No other screen at these prices have all these higher-priced features.

SPEC. SPEC.
30 x 40 \$8.95 27 x 50 \$13.95
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Radiant zipper case for any above—\$2.95
50" Screens are shipped R.R. Expr. collect postage

Closed on Brand New FEDERAL Enlargers

List SPECIAL
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FOR 2 1/4 x 3 1/4 NEGATIVES
No. 240, Diffused, 77.9
lens \$29.95 \$20.95
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Carrying case for 290 or 295 9.95 6.95
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FREE—This Month Only—with any enlarger.
200 sheets 4x5" enlarging paper—FREE

Brand New! FR Latest Model ELECTRONIC FLASH

- Needs only 4 small batteries
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- Switches easily to AC power
- Constant flash value and exposure
- Comes with camera bracket, and AC line cord.

List \$45.50 AWON SPECIAL .. \$29.95

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Ultralite Comet w/nickel cadmium battery	49.95	34.95
Nicholite A.C. & Batt.	54.95	34.95
Hershey #700" A.C. or Batt.	24.95	19.95
RI Dynalite A.C.	32.50	26.95
RI Dynalase w/photoelectric eye	54.50	32.95
FR Model II, A.C. or Batt.	26.95	21.95
FR Model 140, A.C.		

And your old flashgun in trade

Brand New! HEILAND Electronic Flash

JUST OUT. Eliminates separate battery case. AC or batt. Model 64-A list \$9.95 AWON \$38.95
Model 64-B (transistors) list \$9.95 AWON \$38.95

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CHEST 184—Holds 12 300' or 400' 8mm fl. & cans 2.79
CHEST 184—Holds 12 of 15mm reels each chest 1.69
8mm 300 ft. REEL & CAN 4 sets for 3.49
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8mm 400 ft. REEL & CAN 4 sets for 3.65
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ARGUS Sale! ALL BRAND NEW discontinued MODELS

SPECIAL AWON COMBINATION DISCOUNT!
ARGUS C-3 w/case, flash & reg. lens plus SOLIGOR 135 mm f4.5 telephoto lens
BOTH for only—\$64.95

ARGUS C-3	w/case & flash (discontinued)	\$69.95	\$41.95
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ARGUS C-44 <td>w/case & flash</td> <td>\$17.00</td> <td>\$9.95</td>	w/case & flash	\$17.00	\$9.95

SLIDE PROJECTORS
ARGUS 700 watt, RC 29.50 29.50
ARGUS 300 watt w/Auto Changer 72.50 42.95
ARGUS 500 wt w/Auto changer & case 79.50 48.95

Special for ARGUS fans

SOLIGOR, top quality 135mm f4.5 telephoto for ARGUS C-3. List price 49.50 SPECIAL—\$29.95
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AIRQUEST slide trays for Argus projector \$ for \$9.95 12 for \$16.95

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Yankee 4x5 Utility Tank	2.95	2.10
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Yankee Safe life w/3 Filters	4.95	3.89
Airequest Dialmaster Base 14x17	8.07	6.95
Airequest Photocast 4x5 Printer	14.34	9.95
Brumberger 5x7 Adj. Metal Printer	22.00	14.95
Brumberger 5x7 Safe Lite OA	5.95	4.35
Brumberger 8x10 Paper Safe	10.95	8.95
Brumberger 11x14 Paper Safe	19.95	15.95
Fedco Focus Rite Enlarging Aid	2.25	1.75
Fedco No. 100 Dryer 11x14	9.95	6.75
Gr Lab 1608 Luminous Timer	24.95	17.50
Premier A2 Roto Dryer 24x28	46.95	33.95
Premier A1 Roto Dryer 12x36	27.50	19.95
Staticmaster 1" Brush	4.95	3.90
Spot-O-Matic Enlarging Meter	15.00	10.97
Kodak Timer Minutes & Seconds	8.95	8.95
Kodak 25mm Day Load Tank	34.00	24.95
Morse 35 & 16mm Dry. Tank	6.75	4.95
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Attractive cardboard folders for photo presentation.
4x5 \$3.00 for 5 10 for 18.
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8x10 10.00 for 5 10 for 18.

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ALL BRAND NEW—LATEST MODELS—LEATHER CASE INCLUDED FREE!

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YASHICAMAT AUTOMATIC	85.50	56.25
YASHICA 44 (127 film baby reflex)	69.95	44.95
YASHICA 63R (dual 2 1/2, sq. & 35mm)	69.95	44.95
YASHICA 8mm movie	79.95	52.95
YASHICA 8mm movie SST, f2.8 lens	79.95	52.95

KODACHROME PROCESSING

	List	SALE
35mm x 30 exp. mtg.	\$3.00	2.00
35mm x 36 exp. mtg.	2.00	1.50
8mm x 25 ft. mag.	1.00	.65
8mm x 25 ft. mag.	1.00	.65
16mm x 100 ft. roll	3.30	2.30

All film returned via insured mail.
Check or Money Order must accompany film.

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All BRAND NEW! All in factory sealed cartons! Superior equipment and values at bargain prices.

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	List	AWON PRICE
8mm Model #42, f1.8 F.F.	\$9.50	\$5.75
8mm 125, turret 3 lens f1.8	39.50	25.50
8mm 158, f1.9 focusing	124.50	90.65
8mm 158, 3 lens turret	124.50	90.65
8mm 125 magazine, f1.9	39.50	25.50
8mm 173, mag., 3 lens turret	149.50	108.95
16mm 158 magazine, f1.9	167.50	108.95
16mm 173 mag., 3 lens turret	287.50	209.95

PROJECTORS

	List	AWON PRICE
8mm #718, 500 wt, 3 reels, built-in projector & case	162.50	118.65
8mm #118, 750 wt, w/case	169.50	123.90
16mm #118, 750 wt, w/case	199.50	149.00

TAPE RECORDERS

#1500, dual speed, w/case 169.50 137.95

4-LITE FOLDING MOVIE BAR LIGHT

With metal carry case, 2 toggle switches and 7' heavy duty cord. AWON SALE \$7.50
Bulbs remain on bar in case, \$1 ea. with purchase of bar.

NEW, COMPACT MOVIE LIGHT BAR

4-Lite movie bar, with metal case and four bulbs—NEW, MORE COMPACT design—AWON SALE \$10.95 w/4 bulbs without bulbs \$7.95

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Mansfield 8mm Action Editor	\$39.95	\$17.95
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All Editors Include Rewind, Splicer & Baseboard
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SEMI-AUTOMATIC film transport, split-image rangefinder plus ground glass focusing. Complete with Model III camera, case and flashgun. Case discontinued.
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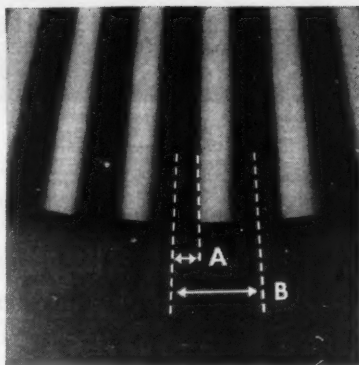
AWON FILMS

108-M West 29th Street, New York 1, N. Y. LA 4-6376

Postage & Insurance must be prepaid.
Items marked "FREE" must be requested at time of purchase to be acknowledged.

(Continued from page 110)

Expose normally, using a fast shutter speed (1/200 to 1/500 sec.). Overexposure will cause image bleeding and will nullify the test. Development is just as important. Process for the recommended time. Try to keep all solutions (developer, stop-bath, fixer, wash) at the same temperature so grain will be



This is how to read your test negative or print: Find the center of two successive blurs (long dotted lines in diagram, this page). Then locate the edge of one blur (short dotted line). The relation of distance A to the total of distance B represents the shutter lag. In the illustration, distance A is about $\frac{1}{4}$

However, the shutter manufacturers apparently feel that the longer time lag allows them to produce a shutter whose overall reliability and life of operation is markedly improved.—THE END

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FACTORY FRESH RELOADS

FILM TYPE	SIZE	3 ROLLS	10 ROLLS
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ANSCOCHROME	135-36 exp	5.35	17 50
EKTACHROME			
KODACHROME	STEREO 15 PAIR	3.95	12.50
KODACHROME	STEREO 28 PAIR	5.35	17 50
KODACHROME	8mm ROLL 25' Double	5.25	16.50
KODACHROME	16mm ROLL 100'	15.75	51 00

Add 5¢ per Roll on Film for postage and Handling

KODACHROME, ANSCOCHROME, EKTACHROME PROCESSING

35mm (20 exp.) }
and 828 includ- }
ing mounting }
per roll }
8mm 25' roll }

1.00

35mm, 36 exp. including mounting..\$1.75
STEREO: 35mm, 15 Stereo pairs
including mounting 1.75
28 Stereo pairs, including mounting 2.75
8mm 25' magazine 1.75
16mm 50' magazine..... 1.90
50' roll.....1.50 100' roll.....2.50

35mm COLOR SLIDE DUPLICATING

* **15¢** each mounted
* 20 for **2.99**

4 x 5	5 x 7
4x 50¢ ea.	5x 85¢ ea.
	3 for 2.00
3 for 4.50	
8 x 10	
8x 1.75 ea.	

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8mm x 25' roll Kodachrome	3 for 5.97
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16mm x 50' mag. Kodachrome	3 for 14.98
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Include 25c for Handling & Postage	

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Custom Color Printing

Any of same size	1	6	12	24
2 1/4 x 3 1/4	25c ea.	22c ea.	20c ea.	18c ea.
3 1/4 x 4 1/4	50c ea.	45c ea.	40c ea.	35c ea.
4x5	80c ea.	75c ea.	65c ea.	60c ea.
5x7	85c ea.	80c ea.	70c ea.	65c ea.
8x10	1.75 ea.	1.50 ea.	1.25 ea.	1.10 ea.
11x14	4.50 ea.	4.25 ea.	4.00 ea.	3.50 ea.
18x20	10.00 ea.	9.75 ea.	9.50 ea.	9.00 ea.

All Film Handled with Care

2x and 3x XMAS FOLDERS and ENVELOPES.....10c ea.

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20 Exp.\$1.00 Mtd. 36 Exp.\$1.75 Mtd.
120, 127, 620.....\$1.00 in Sleeves \$1.25 Mtd.
KODACHROME PHOC 20 Exp \$1.38 Mtd.
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35mm. to 35mm. COLOR SLIDE DUPLICATES
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25 Roll.....\$3.60 100 Roll.....\$4.00

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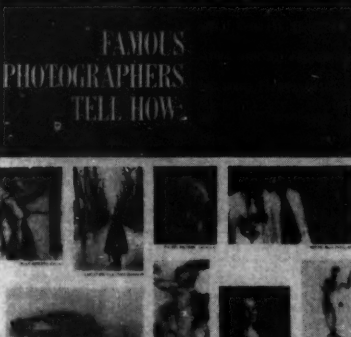
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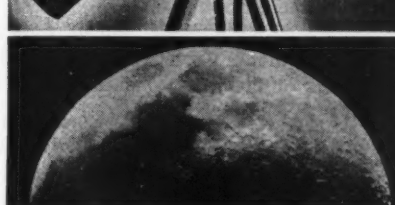
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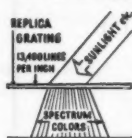
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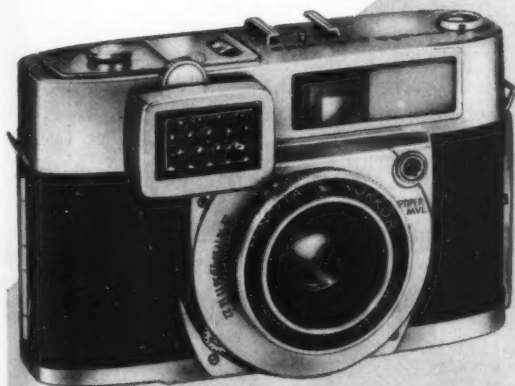


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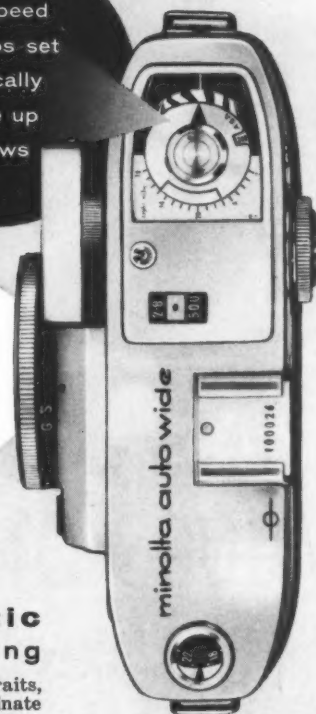
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